

Chemical Week

April 25, 1953

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Chemical Week

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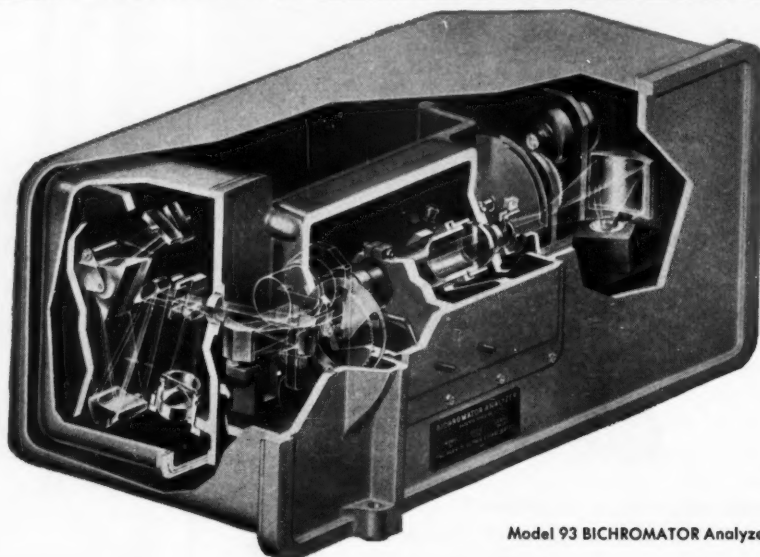
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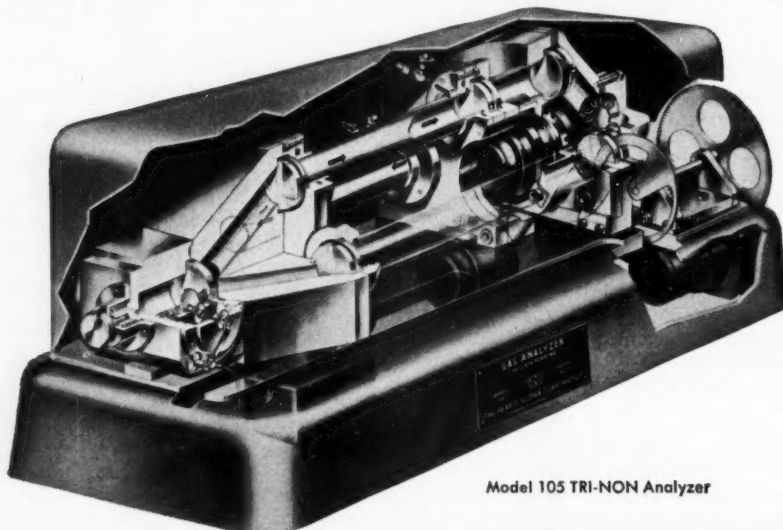


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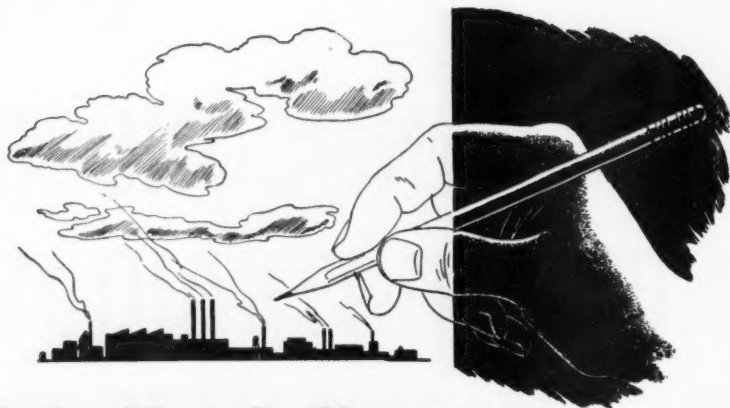
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FURFURAL FACTS



Furfural Facts For Management

One of these days you are likely to be asked to O.K. a project involving furfural use research or an actual commercial application. This chemical is steadily expanding into new fields and many concerns have already found that a study of furfural use is profitable. Here are facts about furfural to help you evaluate what it offers you.

1. TECHNICAL SUCCESS—Furfural is a multi-purpose product. It is a reactive solvent for resins in making brake linings and abrasive wheels; a selective solvent for refining rosin, petroleum, vegetable oils, and C_4 hydrocarbons; the chemical building block for a host of useful chemicals including nylon intermediates and phenolic resins.

2. MANUFACTURE—Furfural is made from the non-food portion of agricultural products, such as corn cobs, the supply of which is renewable annually. Furfural manufacturing plants are located at Cedar Rapids, Iowa, Memphis, Tennessee and Omaha, Nebraska.

3. ECONOMY—Furfural is inexpensive and has been for a long time. In the last ten years the price of furfural has increased less than 15%.

4. SAFETY—Over twenty-five years of commercial experience with furfural in industry has demonstrated that it can be handled safely without endangering the health of those working with it.

5. EASE OF HANDLING—The freezing point of -33°F . is so low that furfural can be stored safely and can be used at low temperatures without requiring special handling precautions in cold weather.



Suggestion—If you would like to know more about furfural itself and the uses which have been developed, we suggest that you write us for Bulletin 204.



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OPINION...

Alcohol Optimism

TO THE EDITOR: We were quite pleased with your writeup (Feb. 21) on our new process and plant for making fatty alcohols and fatty alcohol sulfates from tallow. Our research on raw materials has progressed even more rapidly than we had hoped. As a result, when our plant goes onstream in a few weeks we expect to produce not only fatty alcohols from tallow, but also from linseed, soya bean, cottonseed, corn, sperm, and menhaden oils.

Your editorial comments on the possible effect on alkyl aryl prices were rather surprising to us. We are not producers of dodecyl benzene and have no opinion as to the effect of our tallow fatty alcohols on dodecyl benzene prices. We are optimistic about the future of these new fatty alcohols. There are many applications in varied fields where they will be of great interest.

ALFRED C. STEPAN, JR.
President

The Stepan Chemical Co.
Chicago, Ill.

Curtailed, but Open

TO THE EDITOR: We wish to offer our comment on a Newsletter item (Mar. 21) in which you discuss the reorganization of the procurement setup in the Chemical Corps of the U.S. Army.

From the wording used in your Newsletter it might appear that the Boston office will be completely closed.

We have official information from the Office of the Chief Chemical Officer, Gen. Bullene, to the effect that there will be a procurement office here at the Army Base for the Chemical Corps. It will of course be operated with far less personnel than it now has and will be an industrial liaison office for the benefit of New England business. It will be able to help contractors and prospective contractors in New England in all matters of Chemical Corps procurement. Final responsibility, however, in all matters will be with the New York Chemical Procurement District.

We feel that... without this clarification, New England businessmen

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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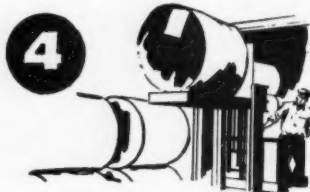
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OPINION

are bound to be led astray by the information . . . in your recent issue . . .

LT. COL. ALBERT A. BROWN
 President
 Armed Forces Chemical Assn.
 Boston Chapter
 Boston, Mass.

In compressing a complex reorganization into a few sentences, we were unable to spell out the details. We are pleased to publish Reader Brown's letter so that no one may misinterpret the role of the Chemical Corps' Boston office.—ED.

Eulogy for Salem

TO THE EDITOR: Your article in the Newsletter (Apr. 4) concerning the Salem, Ore., alumina-from-clay plant is of interest to many people. . . .

There is one statement with which some technical people may disagree. It is mentioned that the "experimental operations were unsuccessful." In some respects in the end it was unsuccessful, but not due to a failure of a technical development in process. I recall the government decided that it no longer wanted to carry on with the operation mostly because of the war's end, and certainly not that the operation failed.

Perhaps many did not know that "some tons" of alumina actually were produced and flowed in a continuous stream from the final calcination step. There were, naturally, intermediate process problems of an in-plant research nature, and over-all cost-per-ton economics deserved a close look.

However, the fact still remains that the Chemico alumina process, which is the one designed for the Salem plant, did produce alumina of high purity, but it was not offered the opportunity to be researched economically. I say all this in a note of respect for the Chemico designers and operators, because . . . few corporations would be diligently minded enough to tackle a large pilot plant with so many obstacles as were set up in the case of the Salem alumina facility.

Commercial agricultural ammonium sulphate was eventually produced there in large daily tonnages (the Chemico alumina process utilized ammonium sulphate in a cyclic manner) since the plant contained salt evaporators potentially capable of about 500 tons of solids per day. This interesting and profitable business was born out of the "unsuccessful" alumina process. It is the opinion of some that this synthetic chemical eventually was caused to overshadow the importance

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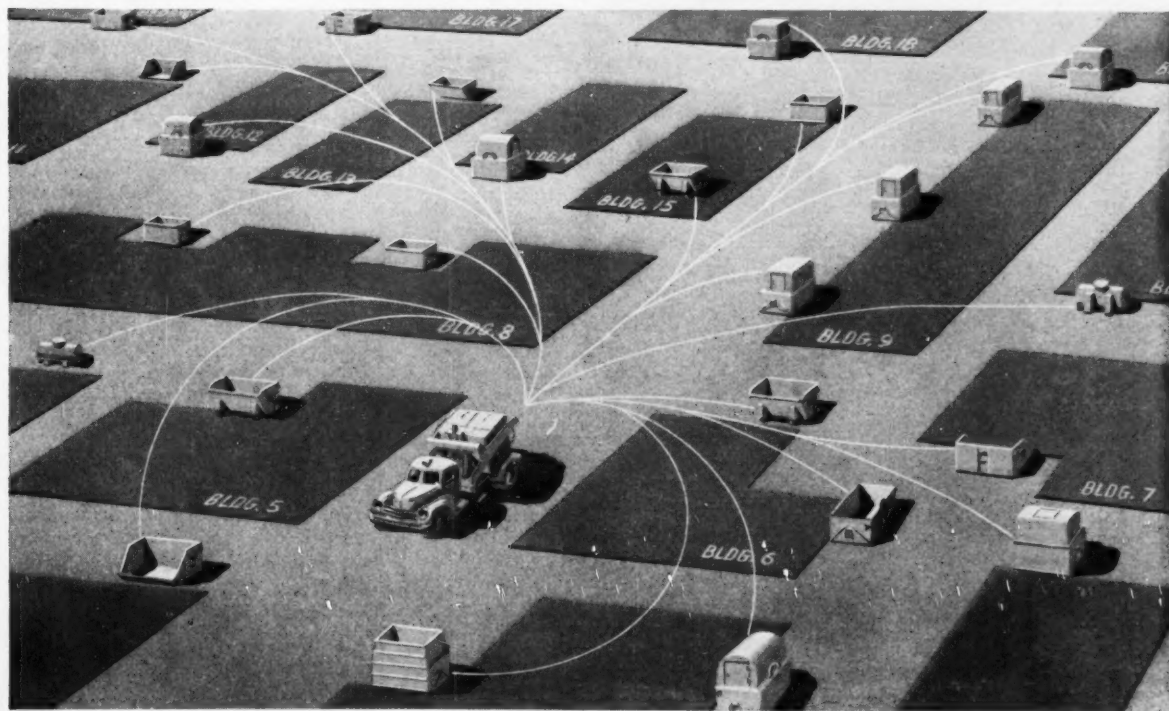
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OPINION.

of alumina; consequently, alumina processing was ended for that time.

The plant proved to be very economically successful to some of its operators; and it offered abundant technical knowledge to all of its management—provided they were able to absorb the same—and operated in a feasible manner. . . .

JOHN ROSENE*

Professional Metallurgical Engineer
Tacoma, Wash.

Thank you, Reader Rosene, for a valuable as well as interesting extension of the history of this project. The word "unsuccessful" was, perhaps, too strong; but we were thinking more of economics than technology. Many ideas that seemed attractive under the exigencies of war have since lost much of their luster.—Ed.

More Amino Makers

TO THE EDITOR: . . . For the past two years, we believe, our firm has supplied a large percentage of the l-tryptophan manufactured in this country. We believe that we have been largely responsible for the drop in price of l-tryptophan, which was quoted at \$700/kg. two years ago and dropped to \$500 after our operations began.

. . . In our operation we isolate tryptophan from lactalbumin.

JOHN SPINELLI

Secretary-Treasurer
Food, Chemical and Research
Laboratories, Inc.
Seattle, Wash.

TO THE EDITOR: . . . We are also a supplier of . . . radioactively labeled amino acids for research purposes. . . .

R. R. BUNTAINE

Manager, Sales Division
Nuclear Instrument & Chemical Corp.
Chicago, Ill.

TO THE EDITOR: We have read with interest your excellent article, "Aminos Spell Opportunity." Particularly so, because of our well-established and prominent position in supplying amino acids to the investigative field for a number of years. . . .

E. DONALDSON

Nutritional Biochemicals Corp.
Cleveland, Ohio

We are glad to record these additional suppliers of amino acids. Reference to the original listing (Mar. 7) will establish the fact that it didn't claim completeness; there are undoubtedly many other firms making one or more of the many amino acids.—Ed.

* Formerly a development engineer, then plant engineer at the Salem alumina plant.

U.S.I. CHEMICAL NEWS

April 25

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★ 1953

Research Links Methionine With Male Sex Hormone

Evidence of a possible relationship between methionine and testosterone—the male sex hormone—is seen in the results of recent studies of induced fatty liver infiltration, it is reported.

It is known that ethionine, an antagonist of methionine, prevents methionine from acting. Ethionine, when present, therefore causes a deficiency of methionine, one manifestation of which is fatty infiltration of the liver. It has also been found that methionine can counteract this effect of ethionine in rats and can protect the animal against death. Other amino acids are ineffective in this respect.

The new investigations have shown that testosterone minimizes the fatty liver infiltration due to ethionine. The effect of the hormone in opposing a methionine-antagonist is thought to be significant in that it suggests a link between methionine and the male sex hormone. This in turn suggests the further possibility of a relationship that methionine might have in influencing the body's production of testosterone or in taking its place in some biological mechanisms.

New Method Deodorizes Qualitative Analysis

Elimination of hydrogen sulfide and attendant odors from future qualitative analysis laboratories may be indicated in a recently published book on new analytical separation techniques. The book, which is reported to be arousing a great deal of interest, deals with a method for early removal of troublesome tri- and tetravalent metals through a basic benzoate separation. Students who have used the method are said to have found it faster, easier, and comparable in results to the older, hydrogen sulfide method.

Plastic Improves Ancient Plant Propagation Method

A vinyl film, coated with a mixture of hormone, insecticide, fungicide, and fertilizer, was recently marketed as an aid to gardeners who propagate trees, shrubs, and other plants by 'airlayering'. The method, which has been used for centuries in one form or another, consists of selecting a branch for rooting, peeling away an inch-wide strip around the branch, and then covering the strip with moss and a wrapping of film. After a certain period of time, roots will have sprouted inside the covering, and the branch is ready for cutting and planting. The new impregnated film is claimed to speed up the process and to increase chances of its success.

U.S.I. Helps Educate Farmers In Best Insect Control Methods To Keep Grains For Food Clean

Pyrenone Insecticides Have Important Role in the Insect Control Program, Affording Protection Against, Instead Of Cure for, Infestation of Grains Destined for Storage

In cooperation with the various farm groups and college extension services, U.S.I. is currently taking part in a major country-wide project to educate grain

farmers in efficient insect control methods. The project is being undertaken in anticipation of demands for more rigid inspection standards to provide cleaner grains for human consumption.

Insect Control a Prime Factor

Tighter supervision will make it imperative that everyone connected with the production and marketing of grain be thoroughly familiar with all factors affecting grain quality.

Foremost among these factors is the presence or absence of insects—whether alive or dead. Under the new standards, for example, an elevator will be less likely to purchase grain containing weevils without docking it. Tighter controls and inspection prevent such grain from being sold for food purposes.

Since a large share of the responsibility for clean, insect-free grain rests with farmers, U.S.I. is helping to make available to them complete information on the latest and most efficient techniques for dealing with the insect problem.

MORE

Wanted—More Information For Potential Chemists

A recent survey by the Manufacturing Chemists' Association indicated that most science teachers feel they need more information in order to advise students about opportunities and careers in the chemical and chemical engineering professions. A spokesman for the Association points out that chemistry is vitally important to the nation's future. It is therefore imperative that potential future scientists be made fully aware of the opportunities for personal achievement and public service in the field.

In line with steps now being taken throughout the chemical industry to fill this need for more information, U.S.I. will be glad to supply interested teachers and students with material on any of the company's diversified line of industrial chemicals.



Protecting grain from the farm to the consumer from the infestations of insects lurking in storage and shipping facilities all along the way is a major problem of the grain trade. Pyrenone Protectants provide a preventive program for accomplishing this protection without toxic hazards.

April 25

★

U.S.I. CHEMICAL NEWS

★

1953

CONTINUED

Best Insect Control Methods

Educational Programs Show How

As one example of how the educational project is working, a series of meetings is currently being held in five key centers of the Kansas wheat belt by the Kansas Wheat Improvement Association and the Kansas Extension Service. Authorities from Kansas State College are on hand at these meetings to explain the entire program of weevil control, including bin spraying, bin cleaning, fumigation, and other techniques.

An important part of each meeting is devoted to a showing of U.S.I.'s motion picture, "Beating the Weevil", which shows the techniques of storage insect control with Pyrene. U.S.I. representatives are also on hand to answer questions and to supply additional information.

Why Pyrene is Important

Pyrene insecticides have a prominent part in the entire insect control project due to the fact that they afford protection against, instead of cure for, the problem. With the new inspection standards, it is equally important that grain sold for food purposes be free of dead insects as well as live ones. Three insect emergence holes in $\frac{1}{4}$ pint of wheat—about 4200 kernels—are enough to rule a whole shipment as contaminated and downgraded for feed purposes only. Hence, killing the insects in infested grain solves only half the problem; they must be stopped before infestation begins.

With Pyrene, the farmer is assured of this kind of protection. A single application stops insects cold at the start, keeps them out of clean grain, and prevents any future infestation, even when the grain is stored in open bins or cribs. Application techniques are easy, and only one treatment is required for season-long protection.

In addition to grain protectant formulations, Pyrene maintains protection literally from the farm to the family, the ultimate consumer. It is formulated in mill sprays and box car sprays, and it is impregnated into paper which is used to package foods.

Adapt Shell Molding To Magnesium Casting

A recent Government report indicates that magnesium alloys can now be cast successfully in shell molds—a process that has not been feasible until now. Shell molds are thin-walled molds of plastic-bonded sand which are well adapted for mechanization and which produce smooth, accurate castings. Previously, they could not be used with magnesium because of the molten metal's high chemical reactivity toward all the principal materials present—air, moisture, and sand.

The report details research that was undertaken in the use of various materials as inhibitors for these reactions and indicates which ones proved most satisfactory. Various plastic materials and mixing procedures were also investigated, and the report includes findings and recommendations on this phase of the process as well.

Carbon, Silica Gel Packet Doubles Food Shelf-Life

Small packets of activated carbon and silica gel, for inclusion in food packages to double the shelf-life of potato chips, nuts, candies, and other moisture-sensitive products, are now available to food manufacturers, according to a recent announcement. The packets were developed as a result of heavy losses to producers of such foods during hot, humid summer months.

Purpose of the silica gel is to absorb moisture which enters the package; activated carbon is included to absorb unpleasant odors that develop even when these foods are sealed and protected from moisture.

The protective agents are enclosed in a small perforated cellophane bag to eliminate the danger of their being consumed with the food.

Market tests during a Florida summer are said to have proved that potato chips packaged with the packet stay fresh and crisp from 10 to 14 days longer than those packaged in the usual manner.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U. S. I.

To hold thermometers upright against the sides of beakers, small, inexpensive stainless steel clamps are now available. Clamps allow thermometer adjustment to any height, hold it steady even when the solution "bumps". (No. 910)

A new rubber-base enamel overcomes problem of attacks of moisture, fumes, and caustic cleaning compounds on machine surfaces by providing a tight, chemical resistant coating that is easily applied and quick drying, the manufacturer claims. (No. 911)

A self-contained portable electric melting furnace for melting, alloying, and casting small quantities of metals weighs 6 $\frac{3}{4}$ lbs., has a built-in pyrometer, and can be lifted easily to pour off melt. (No. 912)

To drain flooded basements, excavations, tubs, etc., a simple portable attachment for garden hose operates on normal water pressure to drain up to 300 gallons per hour, it is claimed. (No. 913)

A new automatic fire alarm system for homes, factories, warehouses, can be set to activate at any temperature up to 225° F., discriminates between normal and abnormal heat rise, and resets itself automatically after activation. (No. 914)

A rust inhibitor for incorporation in salt used for de-icing streets and roads, is said to protect vehicles from salt corrosion. Product is also effective in other salt uses, such as in water softeners and food processing and packing plants. (No. 915)

Pen-size hypodermic grease guns and oilers are now available in a kit for lubrication of small machinery parts in home, office, or factory. Tools can also be used for delicate cementing and gluing operations. (No. 916)

Ordinary paper labels can now be adhered to polyethylene containers with a new adhesive which can be applied in conventional labeling machines, eliminating necessity for stenciling and silk-screening, according to the manufacturer. (No. 917)

A new quick-setting thermoplastic cement requires no air, will set under water, does not shrink, expand, or crack, and permits bonding of metals, wood, plaster, porcelain, stone, concrete, and glass, it is claimed. (No. 918)

To eliminate foaming in laboratory distillations, and to overcome "parallax" errors in burette reading, a silicone formulation is now packaged in an aerosol bomb for releasing small quantities at a time as needed. (No. 919)

PRODUCTS OF U. S. I.

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April 25, 1953 • Chemical Week

Life...on the Chemical Newsfront...

AERO* ACRYLONITRILE IN PLASTICS

Expands Property Range

Cost and quality conscious America has placed heavy demands on the relatively young but progressive plastics industry. These demands are being met through constant improvement in formulation and handling techniques, and by the production of superior plastics.

American Cyanamid Company is proud of the performance of AERO Acrylonitrile in expanding the range of properties which may be expected of plastics, and of its contributions to the advancement of the industry. Technical information and assistance are available regarding this unique chemical and its derivatives.

Better Plastics—Better Products

AERO Acrylonitrile can be copolymerized with many vinylidene or vinyl monomers to yield copolymers

having superior physical and chemical properties. These copolymers have extended the fields of application of thermoplastic resins. They are available as powders for standard molding or extrusion methods, also as calendered sheeting for vacuum forming. Certain acrylonitrile copolymers are admixed with amino or phenolic resins as modifiers.

Copolymerized with styrene, AERO Acrylonitrile contributes increased toughness and greater resistance to heat and chemicals. Addition of a butadiene-acrylonitrile copolymer to a phenolic resin increases impact strength and toughness. Copolymers of acrylonitrile, butadiene and styrene are superior to the cellulosic polymers in heat resistance and dimensional stability, and give greater rigidity to molded and extruded objects.

Great as are these present applications of AERO Acrylonitrile, there

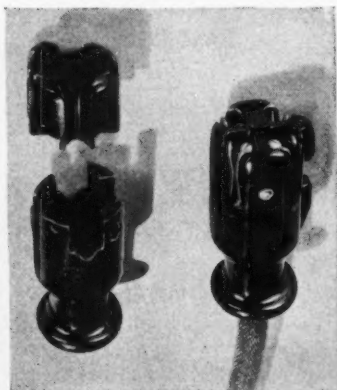
remain large areas for exploration as indicated by growing patent and trade literature reference to new uses in plastics.

Make Your Plastics More Useful

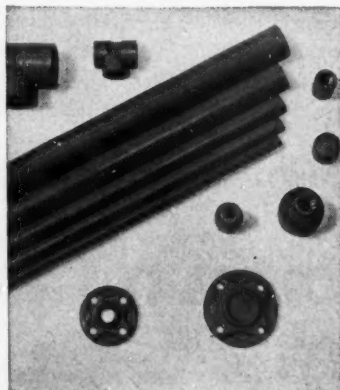
AERO Acrylonitrile and its derivatives merit thorough investigation when increases in the following properties are desired:

Heat Distortion	Surface Hardness
Chemical Resistance	Flexural Strength
Impact Strength	Outdoor Durability

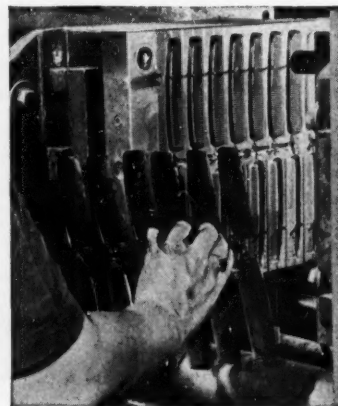
This useful chemical and its derivatives provide valuable opportunities to the plastics industry for continued improvement of its products. We invite you to call on Cyanamid's technical assistance in your development programs. Send the coupon attached for your copies of "Acrylonitrile in Plastics," a new booklet, and "The Chemistry of Acrylonitrile."



This automobile brake plug is molded of a phenolic resin incorporating a butadiene-acrylonitrile copolymer for increased toughness and impact strength.



Extruded pipe and molded fittings are made of Naugatuck Chemical's KRALASTIC. The high impact strength and good chemical resistance of this compound are typical of acrylonitrile copolymers.



Injection molded combs of Naugatuck's KRALASTIC. Combs of this rubber resin compound, an acrylonitrile copolymer, are said to outlast hard rubber combs two to five times.

CYANAMID —the first to offer **ACRYLONITRILE** in commercial quantities in this country

Emulsion Polymerization Points Way to Improved Rubbers, Plastics and Fibers

Modern emulsion polymerization techniques are gaining in favor over bulk polymerization as a method for improved quality control in the production of rubbers, plastics and fibers.

Three Important Factors

In every emulsion polymerization process three factors are of key importance. First—the regulation of the reaction rate. Second—control of particle size, and in turn, of molecular weight. Third—depending on the first two—proper choice of an emulsifier to produce the desired results. Cyanamid's AEROSOL® Surface Active Agents have been found to be excellent emulsifiers in many processes.

How Emulsifiers Work

An emulsifier serves three functions:

1. It produces a large number of stable monomer droplets;
2. It solubilizes the monomer and provides a site for the polymerization reaction;
3. It stabilizes the emulsion after the reaction is ended.

It is thought that the monomer is solubilized in the micelles of the emulsifier and that part of the polymerization takes place in the solubilized state. The degree of solubilization, and the characteristics of the reaction, like polymer size, are determined by the nature of the emulsifier, its concentration, the temperature, the presence of electrolytes, and the nature of this dispersed phase.

Try AEROSOL Emulsifiers for Improved Stability

At optimum concentrations, AEROSOL Surface Active Agents give good mechanical and aging stability to



Latex emulsion points for easy roller application are produced by emulsion polymerization.

finished emulsions. They are particularly useful where high solids content is desired. Colorless themselves, they are valuable in the production of white or light-colored polymers. They have excellent heat resistance and color stability, and are highly recommended for use where final products are subject to adverse heat conditions.

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Just Published for
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Reference Shelf—
“The Chemistry of The
Ferrocyanides”

This hard-bound 120-page volume presents a comprehensive summary of the known physical and chemical properties of sodium and potassium ferrocyanides and of hydroferrocyanic acid, together with known and proposed applications.

The bulk of the literature on the ferrocyanides has been devoted to their use in pigments. Other potentially important applications of these compounds are covered in this booklet.

This review will be useful not only to a variety of industries, but also to scientists in schools and colleges.

The properties of the alkali ferrocyanides and derivatives easily obtained from them are of particular interest in chemical synthesis, separation and purification of commercial chemicals, steel processing, mineral dressing and photography.

In this country, American Cyanamid Company, with its ample supplies of cyanides as starting materials, has been the principal producer of the ferrocyanides. Technical correspondence on these important compounds is invited. Use coupon when requesting your copy of “The Chemistry of The Ferrocymanides.”



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Manufacturers Chemicals Department
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Gentlemen:

Please send me the literature checked:

- ☐ The Chemistry of Acrylonitrile ☐ Sample
☐ Acrylonitrile in Plastics
☐ The Chemistry of The Ferrocymanides

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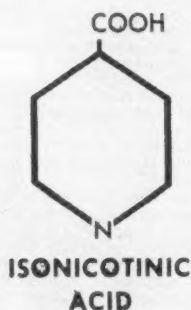
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PYRIDINE



Reilly is now on stream at its heterochemicals plant producing Synthetic Pyridine. Over a decade of research and development made this new unit possible. Its multi-million pound capacity will help to bridge the gap, which has been constantly widening, between supply and demand for pyridine.

3-PICOLINE

From this new plant Reilly is also able to offer more quantities of 2-Vinylpyridine, 4-Picoline, Isonicotinic acid, and polyalkyl pyridines. Further information about any of these chemicals will be furnished upon request.

2-VINYLPYRIDINE

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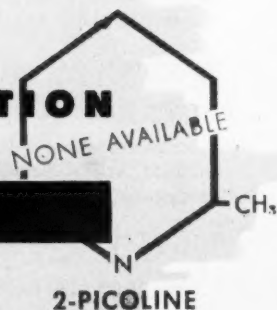
Coal Tar Chemicals for Industry

ACIDS

HYDROCARBONS

BASES

2-PICOLINE



NEWSLETTER

What can the chemical businessman expect this year? Continued good business, but not as "boomish" as the first quarter's, say some top industry economists. The past quarter was good—not only compared with last year's first quarter, which was relatively poor, but also with last year's last half, which was good by all standards.

The "caution" light is inventories. Stocks of consumer goods have been piling up at a rapid rate, are now at a peak figure. Sooner or later—and most think the latter part of this year—industrial output will taper off until these stocks are moved. This inventory readjustment may take a few months—maybe a year. But it's nothing to get upset about; it will simply be a repeat of the short-lived, analogous dip in 1949.

The long-term outlook is rosy. If industry is overbuilt for a peacetime economy—and most experts agree that it is—the chemical industry, at least, will grow up to its expanded capacity faster than the remaining segments. The years immediately ahead, nevertheless, will be ruggedly competitive; and salesmen unacquainted with anything but a sellers' market will perforce get a profound education in the curriculum of the market place.

Bearing out the generalizations on first-quarter showings are actual figures from several chemical process firms:

- Du Pont's sales were 14% above a year ago, and net profit will be up 10-15%. Sales this last quarter reached \$440 million.
- Dewey & Almy suffered a loss last year, but it expects a net profit on this year's higher first-quarter sales.
- Pfizer's \$33-million first-quarter sales (compared with \$30 million a year ago) set a company record. The profit hike was even higher.
- Celanese's sales showed a substantial rise \$44.5 million vs \$33 million) over last year's period—and a \$2.5-million boost over 1952's final quarter.
- Diamond Alkali's net was down, but the \$21.6-million sales figure was well above the April-December average of \$18.7 million.
- Parke, Davis' sales and profits were down, but that's easily accounted for by the chloromycetin controversy.

Some firms haven't finished their quarterly calculations, but they have two-month figures:

- Monsanto's sales "continued at the record levels of the 1952 final quarter."
- Mathieson's sales are up 12%, and net is up 40%.
- Pittsburgh Coke's sales are up (\$8.2 million vs \$7.4 million) and the quarterly net is expected to rise slightly.

Diamond Alkali has decided to take up its option (CW Newsletter, Feb. 14) to buy Belle Alkali Co. (Belle, W. Va.) thus further diversify into organic chemicals via Belle's methane chlorination process.

Any day now the U. S. Supreme Court will make a precedent-establishing decision in the Texas City explosion case. Over 8,000 individual claimants, represented by some 150 lawyers, are seeking to pin responsibility on the government for the ammonium nitrate explosion six years ago. The

suits were consolidated into one petition, and chief spokesman for the attorneys was John Lord O'Brian, well-known to the chemical industry for his defense role in the antitrust suit against DuPont and Imperial Chemical Industries.

In his summation O'Brian challenged a government statement that the nitrate had been handled with normal precautions, contended that the government failed to warn handlers that fertilizer-grade ammonium nitrate is combustible.

That old devil, product liability, raised its head in the state of Washington this week. A superior court at Tacoma awarded \$12,885 to a home economist who alleged that a box of Tide detergent had caused her hands and arms to break out in a painful rash, and she consequently lost her job. A physician testified that it was only one particular box of detergent that caused the trouble.

The judgment, which was against Procter & Gamble Distributing Co., is expected to be appealed to the state supreme court.

Just as irritating as poison ivy is the plague of special state taxes aimed at the chemical industry. Bills proposed in the Florida state legislature would require a \$10 license on every phosphate producer and impose a 50¢/ton severance tax on their output.

Another proposed bill would impose a 15-mill tax on each dollar value of mineral leases. This would be over and above taxes on the land itself. Much West Florida land is under lease for oil rights.

Significant not only to medicine but also to law enforcement is the development of new, modified barbiturates by two Washington, D.C., scientists. The products will be made and sold by Strong, Cobb & Co. (Cleveland). They have been cleared by the Food & Drug Administration.

Standard barbiturates are modified by the addition of pentylene-tetrazol, which makes them nonlethal and eliminates such side effects as mental fuzziness, amnesia and antisocial behavior.

In recent years a large porportion of barbiturates has been diverted into improper channels—"goof ball" addicts and the like—and they have been responsible for many accidental deaths and suicides.

A new process for simultaneous production of trichlorethylene and hydrogen chloride has been developed by Detrex Corp. (Detroit). Hooker Electrochemical (Niagara Falls) collaborated in the six-year development program, and Hooker-Detrex Corp., a jointly owned enterprise, will utilize the process at its Ashtabula, O., plant as soon as conversion can be completed—probably about a year from now.

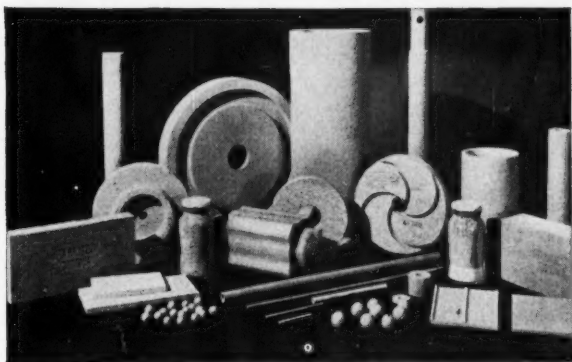
Hydrogen chloride co-product will be piped to a vinyl chloride plant, which General Tire & Rubber will build on an adjoining site.

Chemical tariffs have long been the prime target of "Trade Not Aid-ers" because, feel the free-traders, they're too high. But recent developments in Washington point to maintenance of the status quo or even higher duties, rather than cuts. Eisenhower reportedly will pay a price for extension of the reciprocal trade act as is—and that price is not to attempt to negotiate any new tariff reductions, as the act permits.

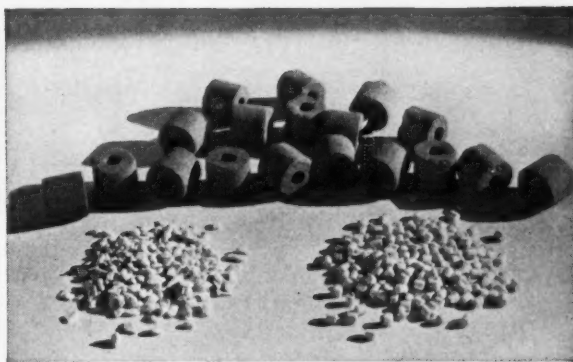
Beyond that, the President's disposition is to let Congress write any new tariff legislation—and the current Congress is solidly conservative on this issue.

. . . The Editors

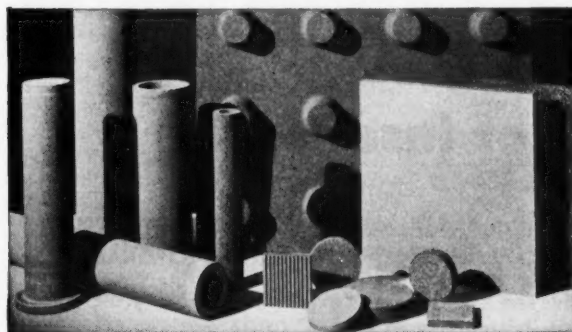
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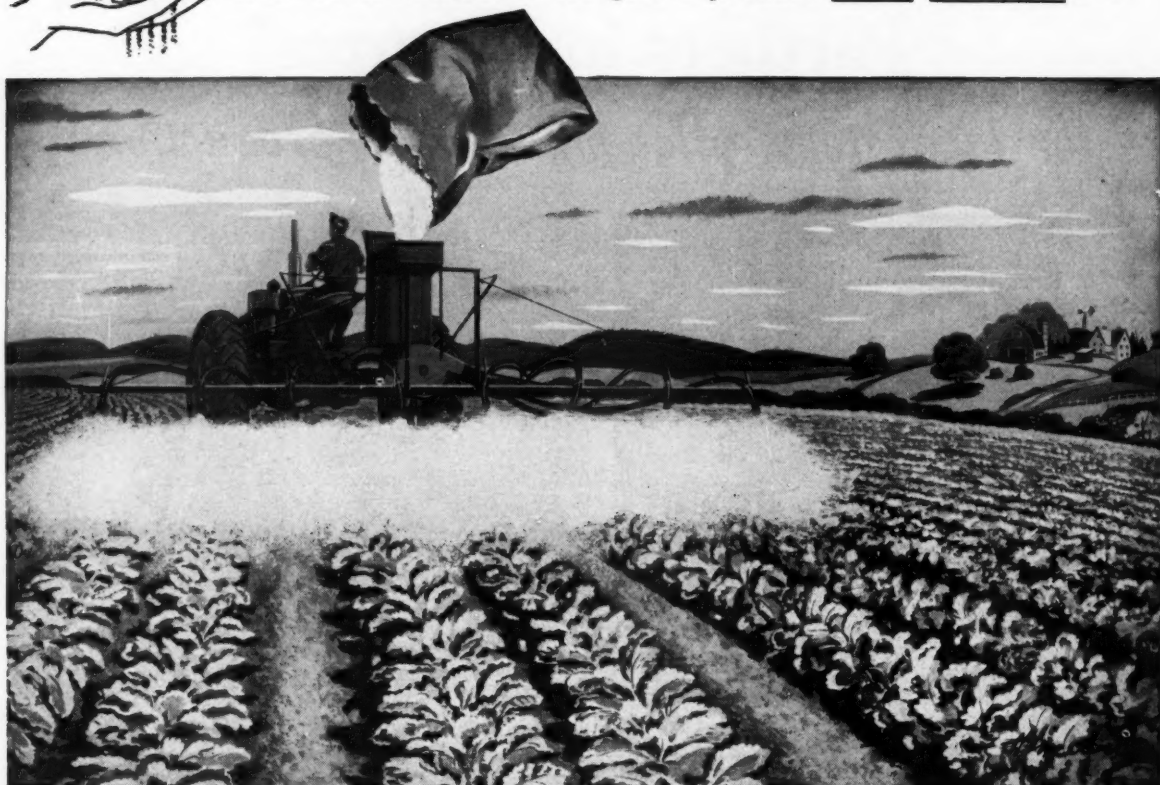
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ture can be utilized to impart a delicate, non-scratching abrasive action.

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MINERAL FILLERS

BUSINESS & INDUSTRY

Back in Five Saddles

Farben, the German chemical colossus, is just about on its corporate feet again. Last week, after a seven-year hassle, the plan to "decartelize" was o.k'd by the Allied High Commissioner.

Ever since VE-Day Farben has been officially tagged as "a dangerous concentration of economic power." And with pipe-dream optimism Allied military authorities first decided—and intended—to split Farben into 80 (and later 40) companies. For both technical and administrative reasons this project foundered, was deemed impracticable. Even the most confirmed trust-buster was chagrined to admit that the prospect of "decartelizing" the I. G. plants at Leverkusen was "well-nigh impossible." They stand on the same site, are mutually dependent.

Another Major Hitch: A good many of the smaller units, scattered throughout Germany, just couldn't stand on their own chemical or economic feet, divorced from the parent. One big question the Germans posed was who would supply the capital and reserves necessary to maintain these independent entities.

Various plans were put forth but none gelled.

In 1950, control of the West German chemical industry—including Farben—was turned back to its former owners. Once again, Farben's stock was listed on the stock markets of several countries (not in the U.S.). But, officially, at least, Farben was not "decartelized."

Last week, however, the Western Allied High Commissioner's German Committee—a group of German businessmen, lawyers and economists—delivered its outline for a Farben split-up to High Commissioner Conant, who approved and implemented it. It contains several major plans:

- Allocation of Farben subsidiaries to five successor companies: Farben Fabriken Bayer, Badische Anilin, Farbwerke Hoechst, Chemische Werke Huls, Cassella Farwerke Mainkur. Major sore points made the split difficult, the detachment of the Cassella plant in particular caused ill-feeling. Disposition of three other subsidiaries blocked progress: Agfa Camera-

Werk, which was given to Bayer; Gewerkschaft Auguste, which was handed over to Anilin; Kalle and a 49% interest in Wacker, which was passed to Hoechst.

- Capitalization of the new companies: Bayer, Anilin and Hoechst will have a nominal capital of 387, 285, and 340 million marks, respectively. The other two, Cassella and Huls are much smaller, will have a capital of under 60 million marks apiece.

- A formula to distribute shares in the new companies to shareholders of I. G. Farben. Actual transfer, which is expected this summer, will take place at an exchange ratio of 10/9. One old Farben share was worth 1,000 Reich Marks, and for it, the stockholder will receive: DM 285 in Bayer (capital stock DM 387.6 million); DM 250 in Anilin (capital stock DM 340 million); DM 210 in Hoechst (capital stock DM 285.6 million); DM 25 in Cassella (capital stock DM 34.1 million); and a proportionate share in the new Huls combine—for a total nominal value of DM 900.

- Agreement has also been reached on allocating Farben tax liabilities to the five successors, retroactive to Jan. 1, '52.

The German liquidators will handle the stock transfer operation; until outstanding Farben shares are turned in, the companies will be encouraged not to issue new stock.

Still Generals in Gray Suits? Dyestuffs, recognized as the financial and scientific wellspring of the Farben cartel, are again "boosting" its successors. Reports of new dyestuffs, new patents, and expansions come from every "segment." Administration at the plant level is virtually the same as in pre-war days; H. Carl Wurster, for example, the first director of Ludwigshafen, is today in charge of Badische Anilin und Sodafabrik.

In a higher echelon, members of the Vorstand (Farben's managing board of directors) are largely acting in "advisory capacities." Fritz ter Meer, former head of the Technical committee, has acted as "expert" for the Bonn government from time to time. Wilhelm Mann is again in charge of pharmaceutical sales at Leverkusen. Carl Krauch, chairman of Farben's supervisory board of directors (the



MENNE: . . . made "certain recommendations to German government . . ."

Aufsichtsrat) and first head of the Wehrmacht (the liaison to Goering's staff) is advising in the production of synthetic rubber and gas for peacetime uses.

The bulk of opinion coming from the German chemical industry outwardly lauds the "decartelization." It's predicted that 1952 earning figures should be available about the middle of this year, that initial dividends of 5-6% can be expected from the three main successor companies.



CONANT: Allied High Commissioner . . . "only technical work remains . . ."

* Members included: Fritz Brinckmann, Fritz Reuter, Walter Schmidt.

Battery Battle: AD-X2 vs. NBS

First engrossed with personalities, interest in the Bureau of Standards-battery additive fight now is shifting to principles involved.

But curiosity still runs high about the additive's make-up, glowing testimonials of users, and conflicting laboratory reports.

The five-year-old dispute over battery additive AD-X2—whether it really prolongs battery life, what it's made of, and how to interpret the various test reports—now is being overshadowed by two issues of basic importance to industry and the entire nation.

These issues, raised by the recent firing of the National Bureau of Standards chief, Allen V. Astin, (CW, Apr. 11), can be stated like this:

- To what extent shall the government try to protect the public from products considered inferior or harmful?

- Is there a danger that science will be ruled by politics in this country as it is, for instance, in Soviet Russia?

Intriguing as AD-X2 and its manufacturer may be, there was no doubt but that public interest this week was shifting to these more fundamental problems. On the other hand, the enigma of the product and the personality of its producer still exert a hypnotic fascination on millions of people from coast to coast. There aren't many experts on the electrochemistry of lead-acid storage batteries, but nearly everybody has to buy batteries.

Arkansas to Manila: The man who won the support of a reported total of 24 U.S. Senators in his incessant efforts to gain acceptance for his product is Jess M. Ritchie, 43-year-old native of Sharpe County, Arkansas. With a sixth-grade education and a hitch in the U.S. Army in the Philippines, he went into heavy construction work and advanced from equipment operator to general contractor.

He became interested in batteries while superintending a U.S. Army Engineers' construction project in the Philippines, and upon returning to the States in 1947, he organized Pioneers, Inc., in Oakland, Calif., to do research on sulfation. Assistance came from the late Merle Randall, retired research associate, Univ. of California.

"Dr. Randall taught me what little chemistry I know," says Ritchie. "The wife and I did the work on the product; Dr. Randall evaluated the work."

Ritchie and his company have been endorsed by the Oakland Chamber of Commerce and the Better Business Bureau of Metropolitan Oakland; and many persons—including Secretary of Commerce Sinclair Weeks and radio commentator Fulton Lewis, Jr.—are fully convinced of Ritchie's good faith and of his product's quality.

Higher Education: Through correspondence study, Ritchie received in Nov. '49, the degree "Doctor of Psychology in Metaphysics" from the "College of Universal Truth," Chicago. That institution received nationwide publicity in a leading article* in *Collier's* magazine (Mar. 22, '52).

Debatable Recipe: Exactly what is AD-X2? So far, there's no precise answer to the question. Ritchie himself takes the stand that its composition is immaterial so long as it works; if it makes your battery last three years instead of one and a half, he argues, what do you care whether it's made of glauber's salt or sawdust?

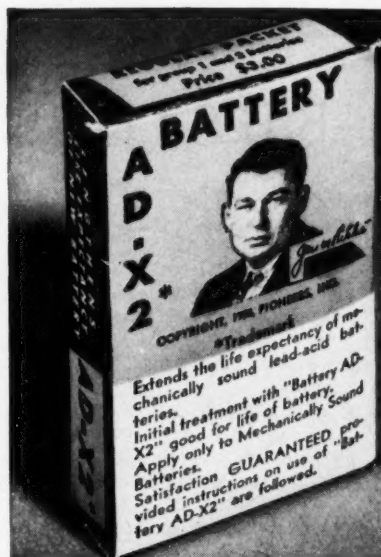
Here's the most that can be said about the make-up of AD-X2:

- On Feb. 21, '49, the Better Business Bureau of Oakland reported this analysis by "an independent chemical laboratory"—sodium sulfate, 60.16%; magnesium sulfate, 28.64%; magnesium oxide, 6.95%; combined water, 3.82%. Ritchie commented that this was the "most accurate" analysis he had seen.

- At the spring meeting of the Assn. of American Battery Manufacturers in 1951, the AABM's business

* In that article, Sidney J. Robbins, the writer, told of receiving that same degree from the College of Universal Truth in just four days of paying \$110 and writing a few pages of notes based on some mimeographed lesson plans handed him by the president of the college, William John Atzbaugh.

Atzbaugh, who says he holds a doctorate from the College of Divine Metaphysics in Indianapolis, told *CHEMICAL WEEK* that his school is affiliated with the "International New Thought Alliance of Hollywood." The curriculum, he explained, "involves religious work only and uses the religious approach to get results where academic psychology fails utterly."

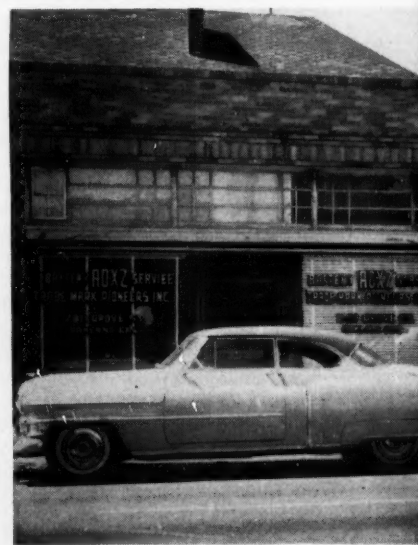


RITCHIE'S PRODIGY: Battery bonanza or another "dope"?

ethics committee reported that AD-X2 had this "typical" composition—MgSO₄, 42.21%; Na₂SO₄, 41.70%; water of hydration, 16.10%; chloride ion, trace.

- In June last year, as analyzed by the chemical division of the Bureau of Standards—MgSO₄, 47.223%; Na₂SO₄, 41.134%; water of hydration, 11.482%; insoluble portion (mainly barium sulfate), 0.16%.

- Keith J. Laidler, assistant professor of chemistry at Catholic Univ., Washington, a booster of AD-X2, says it contains sodium sulfate, magnesium sulfate, barium sulfate, magnesium oxide, "and not less than seven trace elements." In pure water, he adds, its pH is 7.9.



PIONEERS' HOME BASE: Free entry



PIONEERS' RITCHIE: Embattled business man or super promoter?



NBS' ASTIN: Dedicated scientist or biased toward batteries?



COMMERCE'S WEEKS: Defender of small business or political tyrant?

• During a six-month test at the Sacramento Air Material Command in 1948, the U.S. Air Force described AD-X2 as "a powder mixture of anhydrous sodium sulfate and a slightly basic, nearly anhydrous magnesium sulfate with the effect of a catalyst, magnesium oxide."

Ritchie insists that his formulation hasn't changed since Oct. 22, '47, although the name was changed in 1948 from Protecto-Charge to AD-X2. He's never allowed anyone to see the make-up, and he's equally secretive about the place where AD-X2 is mixed. The office is at 2411 Grove St., Oakland, but the plant site is kept secret, Ritchie avers, because that's his only protection against having

anybody find out how he's making the product. It's made by "an expensive process," he confides, "but it will pay off some day."

Conflicting Tests: At least 10 laboratories have tested AD-X2, and their findings point in all directions. Favorable verdicts have come from the U.S. Air Force, Guy F. Wetzel (teacher of automotive mechanics in Lane Tech. High School, Chicago, and contributor to several magazines in the automotive field), Univ. of San Francisco, and the U.S. Testing Co., Hoboken, N.J.

Turning thumbs down on the product were the Army's Signal Corps and Chief of Ordnance, the Navy's Bureau of Ships, the National Bureau of

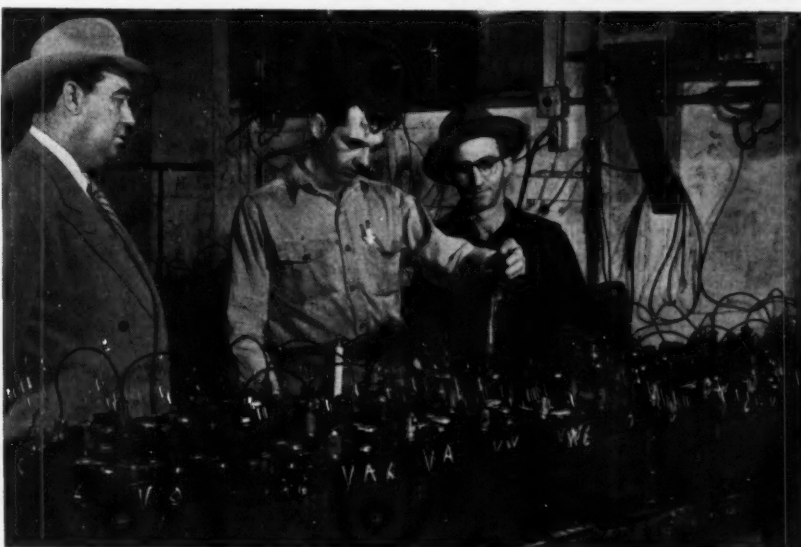
Standards and Consumers Research, Inc. A report on tests conducted at Massachusetts Inst. of Tech. was said by some AD-X2 proponents to refute the NBS finding, but MIT makes it clear that its testers "did not arrive at any definitive conclusions with respect to the commercial value of the product."

On Feb. 10, NBS—having been asked by various members of Congress to re-examine its stand of disapproving all battery additives—made this comment on the MIT report:

"Some of the MIT observations appear to be contrary to results obtained consistently in reproducible controlled experiments by the NBS. Other phenomena reported by MIT are con-



citadel or "dope" shop?



PIONEERS' WORKSHOP: Exclusive process, or could anyone do it?

sistently reproducible under a very limited range of operating conditions; but these phenomena are observed *only* under conditions not encountered in the normal use of automobile storage batteries."

In retaliation, Laidler, serving as consultant to the Senate's Small Business Committee, issued on March 30—the day before Weeks announced the ouster of NBS Director Astin—a detailed criticism of the Bureau's statement. Laidler objects to the NBS test because "the manufacturer was not permitted to be present at the test and a number of serious changes (in testing procedure) were made over his protest."

Pros & Cons, Ad Infinitum: There's no end to the opinions on AD-X2, and since Astin's resignation-by-request, numerous individuals and organizations have been "taking sides."

In support of AD-X2 are testimonial letters from many large users of storage batteries—e.g., City of Oakland, Wichita (Kans.) Transportation Corp., Tram Car Amusement Co., Wildwood, N.J., and various contracting firms. Connolly-Pacific Co. reports a \$3,250 saving by using AD-X2, and another California contractor, Bay Equipment Co., says use of the product "has saved us well over 50% on our annual battery cost and has greatly reduced equipment down-time."

Most battery manufacturers look down their noses at any and all "battery dopes." Latest word from the Assn. of American Battery Manufacturers:

"Battery Assn. has approved no material to be added to storage batteries except approved water and battery-grade sulfuric acid of proper specific gravity. Since battery manufacturers place guarantees on performance of their products, it would appear such specification is quite reasonable. In any thoughtful consideration of the controversy, some consideration should be given to the origin of real improvements in storage batteries."

Most battery makers say they'll consider their guarantees voided if any additives are used. Among some 20 battery manufacturing companies queried by CW last week, only one was not dead-set against AD-X2. Hobbs Battery Co., San Francisco, says it's always gone along with the battery association, but "we'll maintain an open mind about AD-X2" because "everything we've heard about it has been favorable."

Just "Dopes": Most detailed and vociferous response by a battery manufacturer came from C. C. Rose, assist-

ant chief engineer of Willard Storage Battery Co., Cleveland.

"Don't call 'em 'additives' or 'rejuvenators,'" says Rose; "they are battery dopes. Our industry has been bedeviled periodically for the past 25 years by the sale of and claims for these dopes. The annoyance they cause us comes not from the fact that these materials actually extend the service life of storage batteries, because they do not, but rather because of the constant challenge they force on us to *prove* that they don't."

"We find, and I include the entire industry, ourselves in the dilemma either of appearing to be trying to suppress the sale of these materials because they do prolong the life of batteries, or worse still, of facing a lawsuit for product disparagement. Even though successfully defended, such a suit might promote the sale of a dope temporarily and reflect adversely on the battery manufacturers involved."

"Really, we have no reason to oppose the sale of this class of materials beyond the protection of our own reputation, our customers' welfare, and our own products. The best of these dopes (including AD-X2) will do no good, and many of them may do much harm."

Tried and Found Wanting: Richard Perkins, manager of Perkins Battery Corp., York, Pa., notes that additives have been out for many years, and avers that "if they had been good for batteries, manufacturers would have taken them up."

A blanket denunciation was voiced by Carlton Rinehart, chief engineer of Bowers Battery & Spark Plug Co., Reading, Pa.: "We are not using additives, nor do we recommend their use. We have tried all of them and they don't do any good. We also have run lab tests on all of them and results have proved they have no value to batteries. I won't use them in my own car."

Among organizations that have taken stands on the Astin dismissal to date, only the National Assn. of Manufacturers seems to be backing Weeks. Groups that are sticking up for Astin include the Federation of American Scientists, Philosophical Society of Washington, Washington Academy of Sciences, Electrochemical Society and Communication Workers of America (CIO).

Who'll Judge Ad Claims? Late last week, Secretary Weeks conferred with four members of the five-man Visiting Committee of the Bureau of Standards, a group of leading scientists who serve as advisors on NBS programs

and policies. Next month, the Senate's Small Business Committee will hold hearings on the situation, with Astin invited to testify.

Weeks takes the position that the public should decide whether a given product is good or not, and that Astin was usurping that prerogative. He hasn't mentioned foods and medicines in this connection, but says: "As a practical man, I do not see why a product should be denied an opportunity in the market place." He wonders if there may not have been many cases of entrepreneurs who felt they had good products for the people but who "were licked before they started"—and by their very own government, to whom they paid high taxes!"

Typical dissent is this statement by the Atomic Scientists of Chicago: "By forcing Astin's resignation in the way he has done, the Secretary seems to us to be bringing political influences into an institution that has been free of politics throughout its 50-year history."

While AD-X2 may turn out to be only a passing fad and while Astin is only a mortal, it appears this week that they may be with us for many years as symbols of these two problems: enforcement of "fair trade" marketing practices, and freedom from political pressure for researchers.

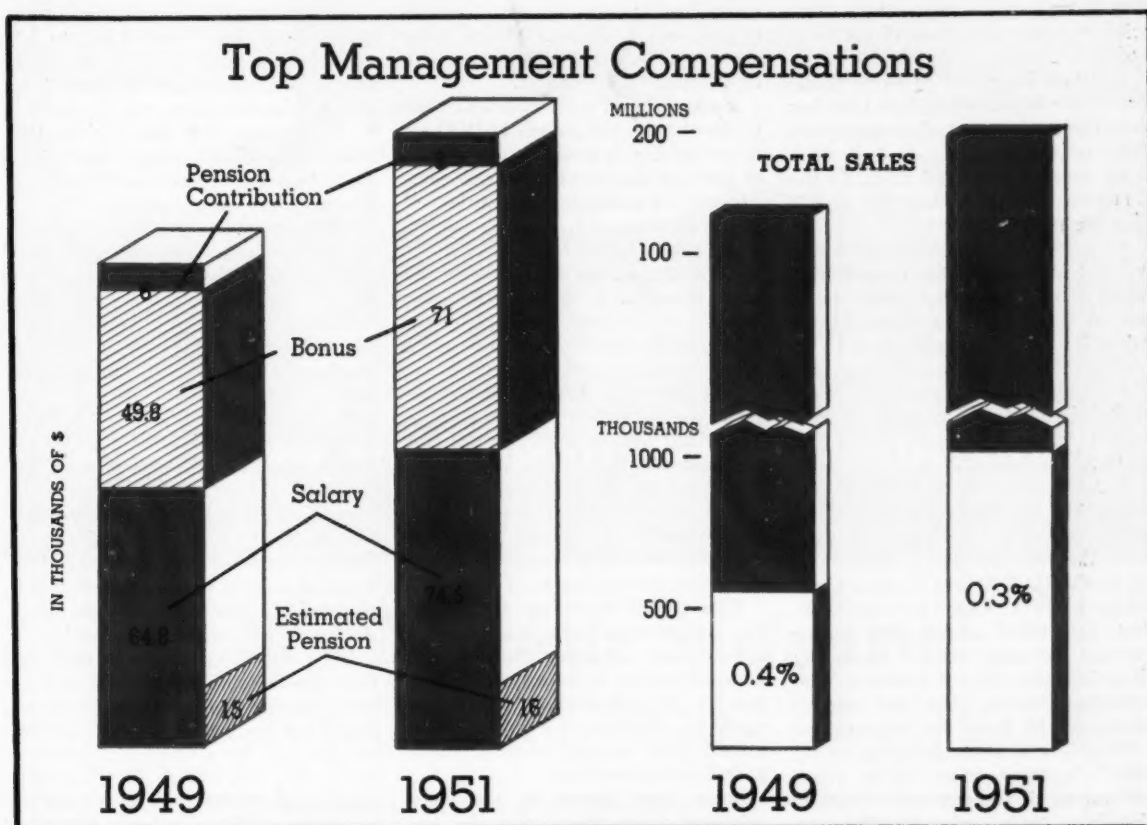
And one of these problems was temporized last week end when Secretary Weeks extended Astin's "Tour of Duty" until the autumn.

EXPANSION.

Dry Ice: Air Reduction Co., Inc. is going to spend approximately \$100,000 to expand its dry ice plant in Niagara Falls, N.Y., and its acetylene plant in Buffalo. Capacities will rise accordingly: by 10-15% in dry ice, by 50% in acetylene.

Ammunition: The Army Corps of Engineers is reported to be eyeing the old Childersburg, Ala., plant, run by Du Pont during World War II, as a prospective location for an ammunition plant should defense planners decide the nation must produce more war munitions. It could, surveyors say, be reactivated in a fairly short time, would cost less than to build comparable facilities elsewhere.

Vinyl Butyl: Monsanto Chemical Co. has increased production of Saflex vinyl butyral interlayer by 50% at its Springfield, Mass., plant. Following hard upon the heels of a 20% increase completed early this year, the expansion permits Monsanto to serve about 60% of the domestic market.



CHEMICAL COMPANIES cross-section: salaries up 13%; bonuses up 42%; pension contributions up 33% over 1949. But compared with sales, such payments are fading away.

For Incentives—Slashed Red Tape

With the proposed major relaxation this week in regulations required by the Security Exchange Commission's S-1 form governing registration, stock purchase plans may vault into the limelight, may become one of the chemical industry's favored methods of paying off top management for services rendered.

For the past several years, stock option plans have taken top billing in schemes designed to keep executives happy (CW, Apr. 5, '52). Rising taxes and the dollar's declining purchasing power have effectively barred straight salary increases as adequate compensation. Bonuses, in some cases have risen since 1949, but not in proportion to skyrocketing sales.

But now, the SEC's action would seem to be offering up the "ideal" solution—stock purchase—as more enticing and far less cumbersome than it has proven to date. If the chemical companies' main objection—red tape—

proves well-grounded, the next year might see a major trend in its favor.

Actually, innumerable ways of compensating top management have been tried in recent years. Spurring the search has been the upgraded tax rate on higher incomes. Result: while sales have increased in recent years, salaries paid to chemical industry executives have not blossomed out proportionally. [One study reveals that of the 25 chemical companies paying the greatest aggregate salaries to executives, salaries cut less into total sales (0.3%) in 1951 than in 1949 (0.4%).]* "Undue hardship" is brought to bear upon the executive if compensation appears in his pay check; hence, companies have more and more tended to exploit other methods, for both current and deferred payment.

* See National Industrial Conference Board Reports: Top Management Compensations, Executive Stock Ownership Plans.

More than One Way: There have been almost as many methods as companies, as many variations of plans as the plans themselves. Du Pont's bonus plan, under which selected employees receive awards, partly in cash and partly in stock has been plugged as "neither philanthropy nor paternalism, but simply good business." In effect, it represents a fairly high incentive (almost 10% of total labor costs in 1951); the amount of stock distributed free is "probably larger than the amount that would be bought by employees even under an unusually attractive stock purchase plan." Monsanto's bonus plan is similar, but limits its total bonus figure at 7% of pre-tax earnings after deduction of 12% on invested capital.

Other companies, determined to give executives "extra benefits," have resorted to deferred profit-sharing contracts that provide for payment of specified income over a period of years

or after retirement. Some "donate" liberal expense accounts and other privileges such as extended vacations and sick leaves.

But most important as an executive incentive compensation since 1950 has been the stock option plan—the agreement of the company to sell stock to its top men at a fixed price. To the company, obvious advantages of this plan are manifold:

- Provides extra compensation that will not be taxed at the present high rates. (And which the employee is not obligated to buy should stock prices fall below contract value.)
- Retains the executives' services.
- Increases their proprietary efforts in behalf of the company. (Rising market values of stocks makes the gratuity more valuable.)
- Attracts new managerial talent.

Considerably boosting stock option's attractiveness to management itself were the rules for tax treatment set up by the U. S. Senate Finance Committee in 1950. (Revenue Act 1950, Sect. 218, which added 130A to the Internal Revenue Code.) Excluding all options that did not qualify as true incentive devices, the Act caused companies to jump the bandwagon.

Flexibility was an additional selling point. In some ways option plans are vague; in others, very definite. Usually a typical plan specifies the type of stock to be optioned, the aggregate amount of shares reserved for option, the option price, and the term of option. But it often fails to precisely specify which executives are to be "honored," does not state the cut due each. Administration of the stock option plan is, therefore, vital to its success, but is wide open for interpretation. The source of the stock to be made available for option may vary, can be from shares authorized but unissued, or may be bought on the open market.

Option prices range anywhere from 50% to 101% of market value, but most fall into the minimum prices fixed by law to take advantage of tax benefits. Option durations differ even more widely; in most cases, however, the employee must pay for the stock in full when the option is exercised.

Still Winning Favor: Most recent convert to restricted stock option is Air Reduction Co., Inc., which will submit its plan to stockholders this week. Of the company's 10 officers, eight are eligible to participate on the basis of annual salary rates; total shares on which options will be granted is limited to 200,000 (either authorized and unissued or reacquired); terminal date for exercise

of option is set at 1958; certain restricting clauses are set up. At present, Air Reduction has no other bonus, profit-sharing or incentive plan for key personnel in effect.

Looking back, most chemical companies that led the parade in 1950 are as yet unable to evaluate the success of stock option as an incentive plan. The reason: most options have not yet been exercised. (Cf. Commercial Solvents' plan, adopted in 1950, in which none of the option stock has as yet been taken up.) General consensus "senses" its success, however, points to retention of its personnel as a "happy omen."

Monsanto says it's sure of its success. Its stock option plan, adopted in 1950, and which set limits for the per cent available to any one executive, froze the price at market value on the day the option was granted, has been 63% "taken up." Today, of the 150,000 shares offered, 94,500 shares are outstanding to 12 officers.

Others Still Searching: Unsatisfactory experiences with earlier stock option plans (dropping markets, high personal income taxes making it difficult for the individual to accumulate funds for exercising his option) have caused some companies to scramble to find other incentives.

Some have turned to the stock purchase plan, unquestionably less flexible, and shorn of the selective time element inherent in stock option. Under that scheme, the executive obligates himself to purchase a definite number of shares of stock usually at a price fixed in the agreement. To cover his commitment, the company generally advances the funds, which may be repaid through payroll deductions (e. g., Atlas Powder's recurring series of stock purchase plans).

One can distinguish stock purchase plans in a number of ways: by method of contribution, by what securities are to be bought, by what the participants get. But because of provisions in the Internal Revenue Code, they tend to serve most generally as deferred compensation for key executives.

Most recent example of the stock purchase plan in the chemical industry is Celanese's plan, adopted by stockholders a week ago. Under terms of the agreement, 2,700 management personnel are entitled to volunteer an annual contribution (based on the company's earnings in any year) into a trust fund to be administered by three trustees "charged with the reinvestment of proceeds through purchase of Celanese stock on the open market." The more stock bought, theoretically the more valuable each

contributor's share becomes.

Still to come is Air Reduction's proposed stock investment plan, to be offered in a package with its stock option proposal this week. Participation will be voluntary, will be limited to management not included in the stock option deal. Major incentive: the return by Celanese of six shares for every five shares purchased.

Which Way the Trend?: Along with its perennial unhappiness with the rigidity of stock purchase, management's chief battle has been with the red tape involved with such plans. Ingenuity, however, has largely licked the former; only the SEC could stamp out the latter.

In the past, the fabulous S-1 form (required under the Securities Act of 1933) has "caused strong men to shudder," caused them to flip aside "happy compromises" because of the tons of paper work involved. Even costliness and the completeness of the financial records necessary have been reported as major factors in discarding stock purchase by some companies.

But now SEC proposes to slash its red tape—"to simplify its form in certain requirements where such action would not be inconsistent with public interest and the protection of investors." The successor form would require full disclosure with respect to provisions of the plan being put into effect, but would eliminate most of the information, formerly required, concerning the company (except for significant developments in the company's capital structure and a summary of earnings). Thus, the "wearing" Items 9 and 10 of S-1 would be an "unhappy memory."

By this token, will chemical companies, pressured by unions, turn from stock option to stock purchase plans? Or will SEC's encouraging red-tape slash heap incentives up for top management? Just as the Revenue Act of 1950 started a major trend in the direction of stock option, is the SEC playing fairy-godmother to the stock purchase plan?

FOREIGN

Sulfide/Chile: Anaconda Copper (American-owned) has put its sulfide plant at Chuquibambilla into operation. Estimates predict the expansion will add 500 million lbs. annually to Chile's present 400,000 tons of copper.

Rayon/Philippines: According to Oscar Kohorn & Co., Ltd., a large integrated rayon yarn and fabric pro-

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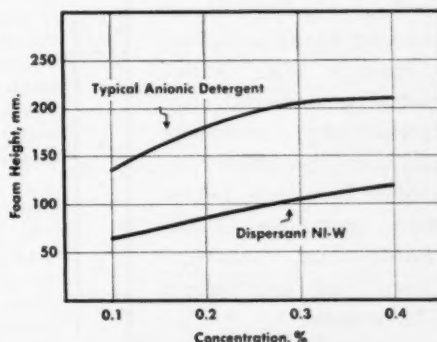
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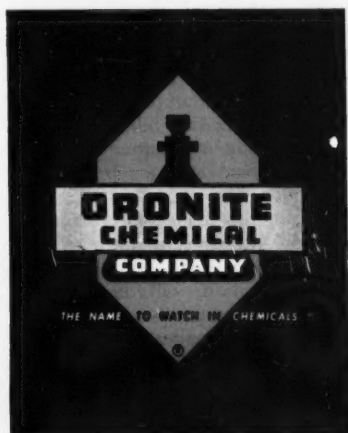
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BUSINESS & INDUSTRY.

duction plant is planned for the Philippines to utilize sugar cane waste on the island of Negros. The proposed setup will include a spinning plant, a weaving mill, and a dyeing and finishing plant. Cost: \$30 million, with operation predicted within 18 months.

Oil/Israel: Six companies, including one from the U.S. and one from Canada, have been granted oil prospecting and drilling licenses in Israel. The American company: Husky Oil Co., Delaware; the Canadian license holder: New Continental Co. of Canada.

Israel's mining law stipulates that firms granted licenses must begin preliminary work within four months, drilling operations within two years. Various local sources report there's a good chance that oil will be found in commercial quantities.

Oil/Canada: The Interprovincial Pipe Line System, opened in 1950 to transport crude oil from Edmonton, Alberta, to Superior, Wis., will this summer be extended 635 miles (at a cost of \$76 million) from Superior to Sarnia, Ont.

All but six miles of the extension will be in the U.S., will be constructed by Interprovincial's American subsidiary, Lakeland Pipe Line Co., Inc. When completed, the system will constitute the world's longest crude oil pipeline—1,765 miles—and will span nearly half of the North American continent.

Pharmaceuticals/India: A pharmaceutical plant, a division of Sarabhai Chemicals Ltd., has been opened at Baroda, 200 miles north of Bombay, India. The installation, the product of two years cooperation and joint planning between Sarabhai Chemicals and E. R. Squibb & Sons, is working primarily on the synthesis of hydrazid, Squibb's antituberculosis drug.

The agreement between the two companies places at the Indian company's disposal the resources of Squibb's full research program, provides training for Indian pharmacists at Squibb's New York laboratories. The capital involved is entirely Indian.

Newsprint/New Zealand: Canadian experts are expected to be engaged to supply technical management in the New Zealand Paper scheme for expansion. The \$60-million newsprint pulp and timber project will begin in Sept. '53; first output is expected by 1956.

The U.S. Export & Import Bank is aiding in the financing. Potential annual production is estimated at 75,000 tons of newsprint, 36,000 tons of kraft pulp, and large quantities of sawn timber.

Priority Simplification

There's a new ingredient in Washington's alphabetical jargon: DMS (for the Defense Materials System). This is the government's new metals priority scheme to become effective when the more elaborate CMP (Controlled Materials Plan) expires.

DMS will not affect the chemical industry much. Chemical companies on defense work will continue to get priority ratings for plants and equipment from the government agencies they're producing for.

Although there's no authority on the



ODM'S FLEMMING: Priority boss is retained, promoted.

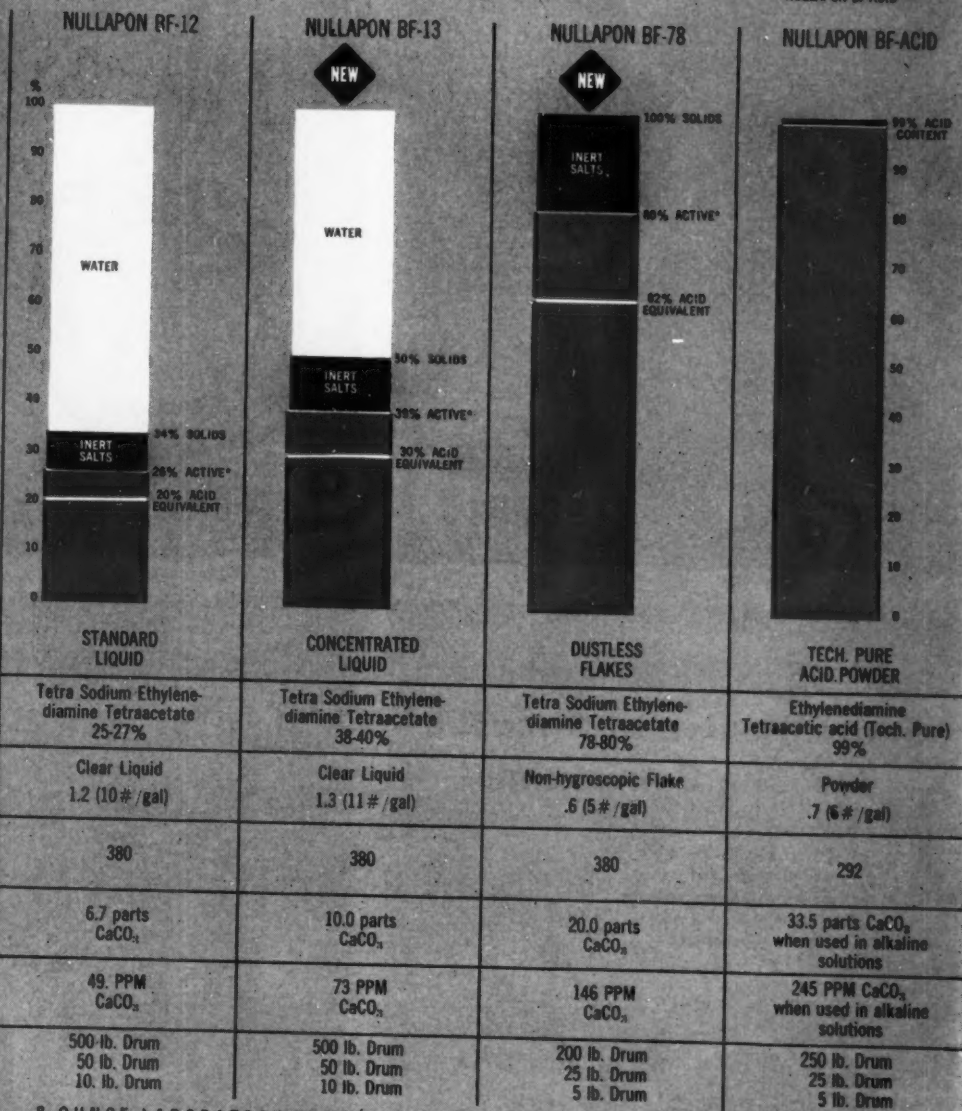
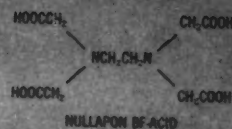
books now for DMS, the Commerce Department's National Production Authority has already issued two regulations outlining the system's operations. It is assumed that Congress will extend the Defense Production Act's priority and allocation provisions. The Capehart mobilization bill, which the Senate banking committee is now considering, contains such provisions. This is how DMS will work:

Flemming at the Helm: National Production Authority, operating under Arthur S. Flemming's Office of Defense Mobilization, will direct steel, copper and aluminum producers to set aside specific tonnages for defense-related business. Probable industry-wide set-asides for the third quarter: steel, 15% of total output; copper, 25%; aluminum, 30%. Flemming, a college

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Density	1.2 (10 # /gal)	1.3 (11 # /gal)	.6 (5 # /gal)	.7 (6 # /gal)
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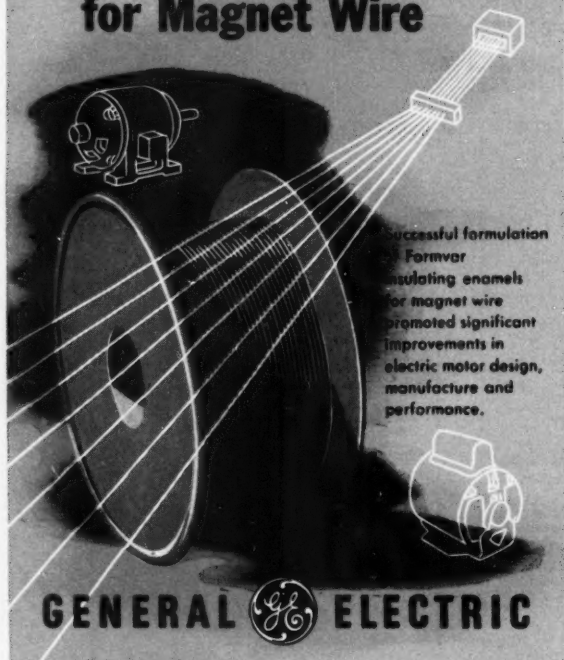
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WATER-SOLUBLE SILICONES (MASONRY WATER-REPELLENT)

This new silicone material makes above-grade masonry highly water-repellent—may well be potentially valuable for other applications.

GENERAL  ELECTRIC

Odor-Free Laminated Plastics for Refrigerator Parts

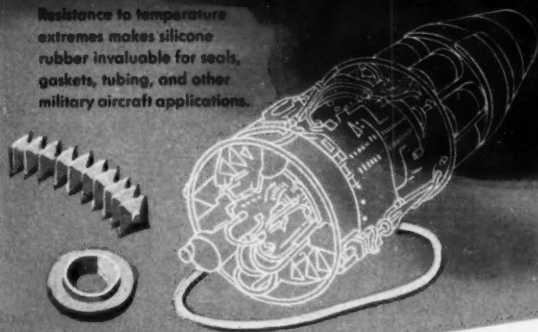


Development of an odor-free laminating varnish made possible use of molded laminated-plastic inner doors and insulating strips on modern refrigerators.

GENERAL  ELECTRIC

SILICONE RUBBER

Resistance to temperature extremes makes silicone rubber invaluable for seals, gaskets, tubing, and other military aircraft applications.



During much of General Electric's 75-year history, G-E chemical progress has made important contributions to the electrical and many other industries. Here are some of the outstanding achievements of this chemical progress,



MICA MAT BY THE MILE

Quantity production of the new mica mat in continuous sheet form makes this new and better electrical insulating material readily available.



pioneered for American business and industry by General Electric men and women and presented as evidence of our dedication to even greater progress and service in the future. Chemical Division, General Electric Company, Pittsfield, Mass.

Section 300-40

You can put your confidence in—
GENERAL  ELECTRIC

hu-mec'tant

A substance having affinity for water, with stabilizing action on the water content of an article.

Example: GLYCERINE!

When product moisture content must be kept constant in spite of fluctuations in humidity, leading manufacturers of food, drugs and cosmetics rely on U.S.P. Glycerine. For many years Glycerine has been the humectant in such famous products as Mennen Lather Shave . . . Chase "Pep-R-Mints" . . . Listerine Toothpaste . . . Pine Brothers Cough Drops.

If you're developing a new product that will contain a humectant, be sure to check Glycerine.

New Eye Lotion Base

For example, a pharmaceutical researcher has developed several new ointment and lotion bases for treating eyes. The improved bases contain combinations of Glycerine and sodium carboxymethyl cellulose. Glycerine prevents rapid drying and film formation, making it easy to incorporate medicinal agents into the base, and preventing the sealing of a treated eye that is kept closed too long.

Balance of Properties

But Glycerine's humectant action is only a small part of the story. You can count on *versatile* Glycerine to serve as—

emollient	lubricant
solvent	demulcent
plasticizer	suspending agent
sweetener	chemical intermediate

Booklets on the application of Glycerine in the drug and cosmetic, food, protective coatings, and textile fields are available. For your copy, write Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

*Nothing takes the place
of Glycerine*

BUSINESS & INDUSTRY

president brought to Washington by Truman, has not only been retained but also has been promoted by President Eisenhower.

The Defense Department and Atomic Energy Commission will issue quarterly allotments of steel, copper, and aluminum to their prime contractors to meet defense-order requirements. Contractors will also get preference ratings to buy necessary tools and components. Their priorities will be passed on to subcontractors and suppliers, who in turn will also get first crack at materials.

Priorities also will be issued to selected defense-supporting projects. But the government will be stingy in this regard. AEC or the Pentagon will have to specifically certify manufacturers or construction contractors for this type of rating. Examples: an electric utility plant to power an atomic energy project, a machine-tool builder supplying an automotive equipment maker on military contract.

That's all there is to DMS. There are no controls or priorities for non-defense consumers. Under CMP, quarterly metals allotments had been issued to all consumers—defense and civilian alike. But one significant type of control will continue after June 30: complete allocations on such scarce materials as nickel-bearing stainless steel, nickel, cobalt, tantalum, molybdenum, titanium, and diamond bort.

LEGAL

One Hatchet Buried: Two of the "big three" soap manufacturers, Colgate-Palmolive-Peet and Procter & Gamble, have settled a court fracas by agreeing to exchange nonexclusive licenses on various patents relating to detergents in dry-powdered form. C-P-P had sued P&G in U.S. District Court in Cincinnati three years ago, seeking to affirm its right to market detergents under those patents, and asking that P&G be ordered to refrain from asserting infringement.

Company Stands Firm: In denying a governmental allegation that its advertising had been "misleading and deceptive," Kordol Corp. of America insists that it can substantiate whatever claims have been made for its Kordolin antipain tablets. The Federal Trade Commission has filed a complaint attacking the Kordol claims "because they represent that the preparation gives permanent relief." A hearing will be held May 9 in New York.

Hadacol Sues Bank: The once prosperous, now bankrupt companies that

made and sold the alcoholic patent medicine "Hadacol" are in the news this week with their law suit against the Guaranty Bank & Trust Co., Lafayette, La. Milton F. Rosenthal, trustee for the LeBlanc corporations, has sued for recovery of \$6,666.91, which he says the bank paid out from its Hadacol deposit after the bankruptcy court ordered all LeBlanc funds frozen.

Ownership Tangle: Construction of a bridge across the Delaware River at Philadelphia may be delayed because of a complication involving a chemical plant whose ownership is changing. The plant was built by the U.S. Government for Bigler Chemical Corp., and later the government made an agreement to sell the plant to Publicker Industries, Inc. Publicker doesn't want the bridge approach to be built over the plant, and holds that condemnation proceedings won't work because the right of eminent domain doesn't apply to federal property.

KEY CHANGES . . .

Harry C. Webb: To executive vice-president and director, Pan American Sulphur Co., Dallas, Tex.

Osborne Bezanson: To chairman of the board, Chemstrand Corp., Decatur, Ala.

Henry H. Bitler: To president and chief executive officer, Chemstrand Corp., Decatur, Ala.

George M. Walker: To vice-president, chemical division, Koppers Co., Inc., Pittsburgh, Pa.

Porter Sesnon: To board of directors, Pabco Products Co., Inc., San Francisco, Calif.

M. Nielsen: To vice-president, Babcock & Wilcox Co., New York, N.Y.

W. H. Rowland: To vice-president, Babcock & Wilcox Co., New York, N.Y.

Willard E. Henges: To director, Sun Chemical Corp., New York, N.Y.

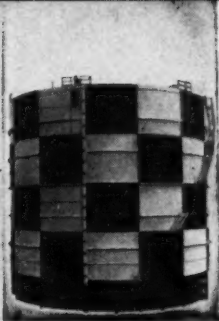
Peter P. Alexander: To chairman, board of directors, Metal Hydrides, Inc., Boston, Mass.

Louis W. Davis: To president and general manager, Metal Hydrides, Inc., Boston, Mass.

Harry B. Marshall: To vice-president, Ciba States Ltd., Toms River, N.J.

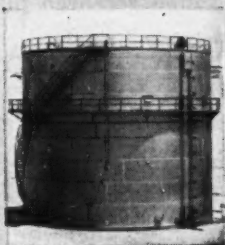
Frank W. Dennis: To vice-president, industrial relations, Hooker Electrochemical Co., Niagara Falls, N.Y.

users of chemical process



and industrial gases

get rid of



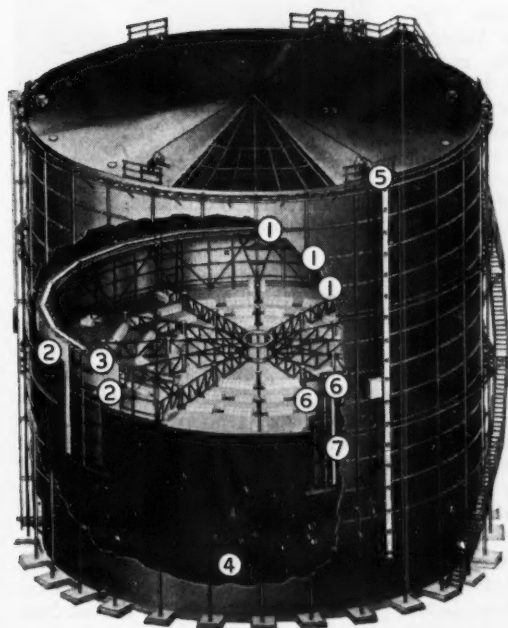
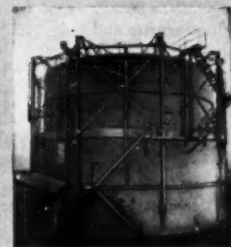
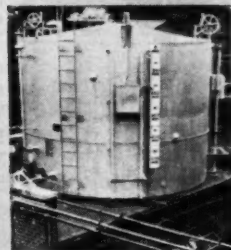
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RESEARCH Plan for Planners

"Operations diagnosis" is a new comprehensive approach to the problems of sound research planning.

Here are its underlying principles, how they are applied for results.

The perfect industrial research program goes straight and true to the heart of its goal. It never stumbles into blind alleys, or falters at the threshold of new opportunities. In short, it keeps the company it serves well ahead of competitors and on a profitable and progressive commercial road.

If your research program fulfills these requirements, you're the only industrial research executive in the U.S. who can afford the risky luxury of complacency. More likely, you're still striving for perfection, asking yourself a raft of stickling administrative questions in the process. They probably boil down to these fundamental few:

- Can the blind alleys and false starts be eliminated or reduced? Can wasted effort in the prosecution of research be avoided? Can the productivity of research manpower be increased? Or very simply, can the corporate research program be made more effective?

Happily, the reply in each case is affirmative. At least that's the considered opinion of Director Clyde Williams and his Battelle Memorial Institute research planning experts. Their optimism, moreover, is backed by experience with the new technique of "operations diagnosis"—an integrated scientific approach to the problems of industrial research planning.

Two Steps: Operations diagnosis is essentially a two-step procedure of analyzing the problems of a company to see where research should be applied, then determining how it should be executed. First step of the procedure actually determines the stakes of the game, highlights the objectives of an organization in relation to the different avenues of research it must consider. Next, the technical and economic risks associated with the alternative research programs are evaluated to provide a realistic basis for selection.

But before the operations diagnostician can begin to assemble the practical data needed for the formulation of a sound research plan, he must have a pretty good idea of what makes a particular company tick. Operations research gives him part of the answer.

The term "operations research" came into vogue during World War II, designates the application of scientific methods to problems outside conventional fields of science. At first, these problems were mainly military; later, business and industrial problems were considered.

Briefly, an operations research study works something like this: the problem is defined; operational relationships and causal factors are determined; experiments are conducted; and series of equations are set up to



BATTELLE'S WILLIAMS: For salient queries, affirmative replies.

show the contribution of these causal factors. Results are predicted if their magnitudes are known; or the equations are solved using optimum causal factors to provide a desired result.

On the strength of information gained from the operations research effort, specific conclusions and recommendations may be formulated. But operations research is only part of the story. There's another essential ingredient; and that's engineering economics. The latter relates the facts of engineering to the facts of economics, involves such things as the analysis and appraisal of industrial markets, industrial customer preference, uses for new products and waste materials, raw materials supply, diversification



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The famous Jabsco neoprene impeller, self-priming pump—generally recognized as the pump which delivers more liquid within its pressure range than any other pump in its weight, size and price class—is now available in hard rubber construction for handling acids, alkalis and other corrosive solutions at moderate cost.

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RESEARCH

studies and industrial logistics. It amounts to a means of predicting technical-economic opportunities and risk. Together with operations research it constitutes the technique of operations diagnosis.

. . . And What They Do: Here's how operations diagnosis can be put to work for increased research efficiency:

Take the case of Hypothetical Chemicals, Inc., faced with the problem of determining the size of its upcoming research budget and the major areas in which research should be performed. Hypothetical Chemicals has a good earnings record. There is nothing radically wrong, but sales have been leveling off and even slipping a little. Production costs, on the other hand, are edging up.

Principal questions facing the management of this firm are, roughly: What part of the budget should be allocated to cutting process costs, what part to boosting product quality, and what part for new product development?

First step in the operations diagnosis is the development of a model representing the entire business activity of the company. In effect, this means that an equation is developed to express net profit in terms of all variables influencing net profit. This is not the conventional static break-even-type analysis, says Williams, "but an analytical way of expressing business variables to take into account their dynamic character."

When the model is developed from empirical data, it must be tested. Predictions for the operation of Hypothetical Chemicals are made from it and compared with actual results. If they agree fairly well, the model is considered a valid relation of cause and effect. With this mathematical model, changes in product quality or production costs may be calculated in terms of net profit. And the probable influence of a new product on net profit may also be determined.

In the case of Hypothetical Chemicals, the model showed these net profit potentials for alternative research projects:

- \$100,000 profit potential per year for new product A.
- \$60,000 profit potential per year for new product B.
- \$40,000 profit potential per year for process research aimed at reducing costs.
- \$2,000 profit potential per year for process research aimed at quality improvement.

Next step is to determine the technical and economic risks involved. The

alternative research plans are outlined in terms of manpower, equipment and costs. Here technical judgment, based on technological knowledge and experience, is used to appraise the technical feasibility of alternative plans. Conclusions:

- Research on new product A: X-dollar cost with relatively high technical risk.
- Research on new product B: 2X-dollar cost with moderately high technical risk.
- Process improvement for cost reduction: ½X-dollar cost with reasonably moderate technical risk.
- Process development for quality improvement: ½X-dollar cost with relatively low technical risk.

And that's the basic data needed for a decision. The choice: work on new product A should be included in future plans. The profit potential of \$100,000 at the estimated research cost is worth the risk. Also eligible: research on process improvement for cost reduction; profit potential of \$40,000 is high enough to justify the risks. Less favorable prospects and total budget limitations veto the other possibilities.

Most companies today run through this kind of analysis, whether they always realize it or not. But conscious integration of many of the familiar methods of research planning into a formal systematic approach is a new and welcome innovation.

New Naphthalenes: Three new naphthalene derivatives are available in research and developmental quantities from Raymond C. Crippen Research and Development Laboratories (Baltimore, Md.). They're: α -naphthaldehyde; α -naphthyl carbinol; and α -naphthoic acid.

Over the Boundary: Work is now in progress on a major expansion of Union Carbide and Carbon Corp.'s (Electro Metallurgical Div.) metallurgical laboratory (Niagara Falls, N.Y.). The addition, in the form of a new wing on the existing building, will double the laboratory's present physical capacity.

Across the international boundary in Niagara Falls, Ont., North American Cyanamid Ltd. has just completed an expansion program of its own. At its Niagara plant, the Canadian firm has opened a new process and product development laboratory. To be staffed by 20 chemists, engineers and technicians, the lab is lauded as the "biggest step forward in research in the 44-year history of the company."

Turba-Film Evaporation Process Achieves Amazing Results!

Turbulent thin film principle evaporates Time-at-Temperature sensitive materials...in seconds.

The Turba-Film® Continuous Evaporator employs a totally different concept of evaporation. Makes heretofore extremely difficult evaporating processes simple and rapid. Actually evaporates most substances in a few seconds!

Here's how the patented Turba-Film Evaporator works. The substance to be evaporated is fed into the evaporating section. Here it is whirled against the wall by controlled-speed rotor blades. This forms a thin turbulent film, centrifugally held to the wall, which spins in a gravity flow through the chamber and out... completing the process. The vapors rise into the separating section where rotor blades beat out any entrained droplets and force them back through the evaporating section.

So thorough is this Turba-Film process that no substance requires re-circulation... the desired concentration is achieved in one pass!

So fast is the Turba-Film Evaporator action that proper heating is done in seconds. Eliminates hydrostatic head. No localized overheating. Eliminates vapor binding on heat transfer surface. Maintains high over-all heat transfer coefficient of from 100 to 500!

Colors, flavors, potency, odor, nutritional and other valuable properties are retained to a much higher degree. Particularly important for Time-at-Temperature sensitive materials such as: pharmaceutical "mycins," vitamins, malt extracts, juice concentrates, etc.

Because such a small quantity is in process at any given time, the Rodney Hunt Turba-Film Evaporator permits quick change-over from one product to another. Makes cleaning and maintenance easy with minimum process hold-up. Allows constant quality control.

The turbulent thin film principle permits concentration to very much higher viscosities and solids content than is practical with conventional equipment. The Turba-Film Evaporator will satisfactorily concentrate heavy viscous materials in excess of 20,000 centipoises.

Turba-Film processing has also proved strikingly effective for deodorizing, stripping and for evaporation of water or solvents from solutions of organic compounds. When distilling, the residues are discharged continuously and are not subjected to re-circulation and "cooking." Where only the vapors were wanted, Turba-Film has distilled up to 99% of the material!

The Turba-Film Evaporator (Luwa Process, Switzerland) is particularly important for applications which are difficult or uneconomical to process conventionally.

Please consider our complete engineering staff at your disposal for consultation on any possible Turba-Film application. We have the facilities for making test runs in our pilot plant: or we can provide a portable laboratory unit for use in your own plant.

Models available in ranges from 40 to 2500 lbs./hr. of water evaporation. Stainless steel construction.

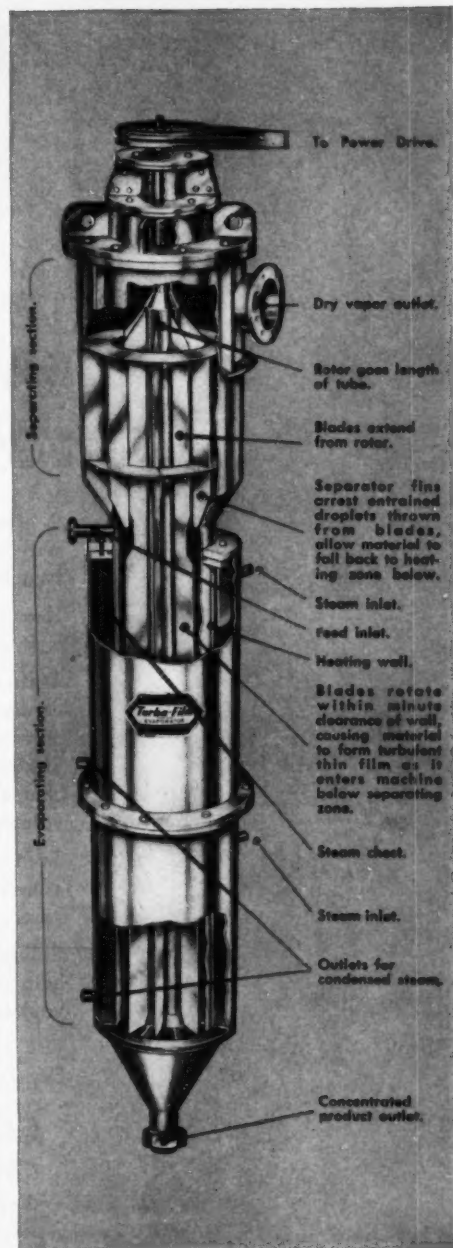
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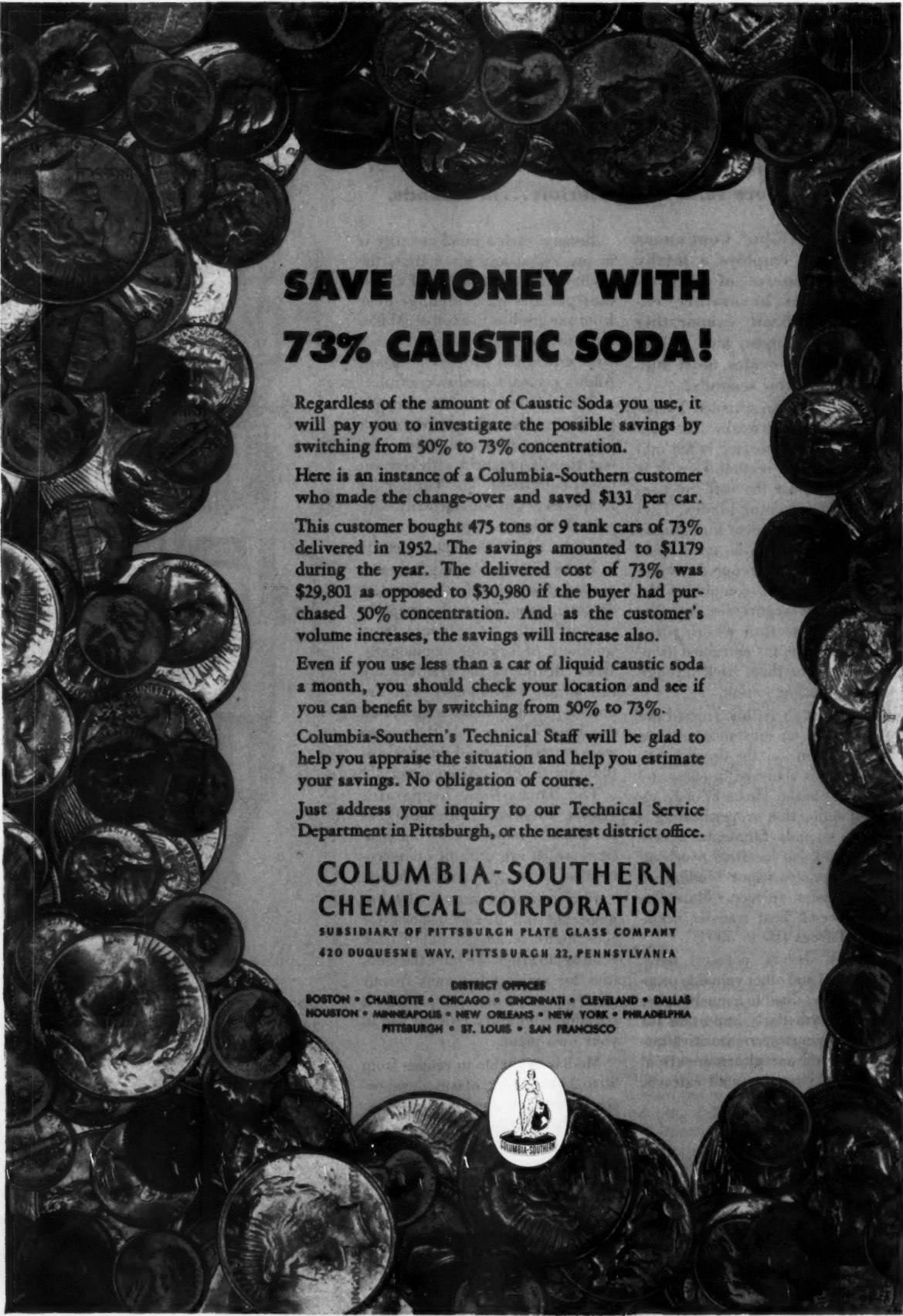
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Here is an instance of a Columbia-Southern customer who made the change-over and saved \$131 per car.

This customer bought 475 tons or 9 tank cars of 73% delivered in 1952. The savings amounted to \$1179 during the year. The delivered cost of 73% was \$29,801 as opposed to \$30,980 if the buyer had purchased 50% concentration. And as the customer's volume increases, the savings will increase also.

Even if you use less than a car of liquid caustic soda a month, you should check your location and see if you can benefit by switching from 50% to 73%.

Columbia-Southern's Technical Staff will be glad to help you appraise the situation and help you estimate your savings. No obligation of course.

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RESEARCH

Newcomer: Catalase, the enzyme that decomposes hydrogen peroxide, has a new producer—Armour and Co. (Chicago, Ill.). Available for development work, the Armour product is a tan powder—one pound of which can liberate almost 5,000 cu. ft. of oxygen from dilute peroxide solutions. Catalase, reports Armour, is being evaluated in conjunction with hydrogen peroxide for the selective control of microorganisms in dairy products and other edible preparations. But commercial application of the enzyme in the food industries is already a reality. It's a component of a newly introduced (CW, Mar. 21) product for the preservation of dried eggs.

Helping Hand: Three salaried employees of M. W. Kellogg Co. will, each year, have the opportunity to obtain full tuition grants for university study while they maintain their regular base pay. It's part of a new, somewhat unusual scholarship plan set up in honor of the late Morris W. Kellogg, founder of the company. One grant for the pursuance of a master's degree, two for a bachelor's degree will be awarded annually.

Kellogg says: "The scholarships will be offered . . . to selected salaried

employees . . . , giving them the opportunity to attend full time in an accredited college or university. Candidates will be selected on past scholastic achievement, experience and progress in their jobs, leadership qualities and . . . potential."

Add Ten: Ten new compounds extend the list of more than 3,500 research chemicals offered by Distillation Products Industries (division of Eastman Kodak Co.), Rochester, N.Y. Included in the new arrivals: acrylamide; 2,5-dimethylfuran; 2,5-diphenyloxazole; phthaloyl chloride; and m-xylene.

Ink Aid: Transa Flo Yellow 72 T 18 is the newest pigment offering by Ansbacher Siegle Corp. (Staten Island, N.Y.). A transparent Hansa yellow toner, the product is earmarked exclusively for use in printing inks. Ansbacher Siegle claims that inks containing the new yellow (and lithographic varnish) don't lose tack, become short and buttery after several months. Inks made from resinated Hansa yellows and lithographic varnish ordinarily tend to thicken as they age.

Progress With Purines

In the jargon of the cancer-researching fraternity, 6-mercaptopurine means progress. A new and highly promising anticancer agent, the compound has proved useful in the treatment of leukemia. It's not a cure, only halts the disease temporarily.

But the new agent rates a lot of hard study on another count. According to a quintet of medics at New York's Memorial Center for Cancer and Allied Diseases the substituted purine's mode of action differs from that of other materials used to combat human cancer.

One hundred and seven patients have been treated with 6-mercaptopurine by Memorial Center physicians. Of 45 children with acute leukemia, 14 showed temporary disappearance of the disease for one to six months following therapy. Eleven additional children were substantially improved. Of 18 adults with acute leukemia, three obtained complete but temporary regression of the disease.

Forty-four patients with other forms of cancer were not helped by the new agent, with exception of five suffering from chronic myelocytic leukemia. Administered by mouth, the purine is reported to be well-tolerated by both children and adults.

Production Blocker: In its new, leu-

kemia-battling role, 6-mercaptopurine takes its place beside the antifolics, ACTH and cortisone. But it apparently does its beneficial work in a substantially different way. Evidence: acute leukemia sufferers who are resistant to the antifolics or the hormones do not necessarily show resistance to the substituted purine. Just how the new anticancer compound does function is not completely clear. But, by analogy with its effects on bacteria, the mercaptopurine is thought to damage the cancer cell by interfering with the production of vital nucleic acids.

Related to the building blocks of nucleic acids, 6-mercaptopurine is one of a large series of such compounds* synthesized by George H. Hitchings and Gertrude B. Elion of Wellcome Research Laboratories (Tuckahoe, N.Y.) and tested for anticancer activity at Memorial's Sloan-Kettering Inst. for Cancer Research. The compound proved a real eye opener when it became the first in the Institute's program to give a reproducible cure of a standard test cancer (Sarcoma 180) in mice.

* Daraprim, Burroughs Wellcome and Co.'s new antimalarial, also came out of this group.

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AN ADVERTISING PAGE

by the HOUSE of J. HAYDEN TWISS

A review of interesting products and services

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READILY AVAILABLE—Reilly Tar & Chemical Corporation, a pioneer in the production of coal tar chemicals, has entered a new field. They are now offering a series of acetylene derivatives, Methyl Butynol, Methyl Pentynol, Dimethyl Hexynol, and Dimethyl Octynediol. One of these compounds, Methyl Pentynol, is used in the formulation of a sleep-inducing drug. The others are being investigated by a wide variety of industries.

After years of research and development in acetylenic compounds, Reilly is now prepared to custom make these derivatives for the chemical and pharmaceutical industry. For further pertinent information write to Reilly Tar & Chemical Corporation, Merchants Bank Building, Indianapolis 4, Indiana.

NEW ANTARA CATALOG—A new 28-page catalog has just been issued by the Antara Chemicals Division of General Dyestuffs Corporation. The catalog covers such products as detergents, sequestrants, and dyeing assistants. It lists important application suggestions in a wide range of industries, including agriculture, cosmetic, latex, leather, metal, paint, paper, rubber, textile and synthetic fiber fields. A new and simplified nomenclature system for Antara's entire line of products is also introduced in the catalog. Copies of Antara's catalog may be obtained from the company offices at 435 Hudson Street, New York 14, N. Y.

INDULIN IN ASPHALT—INDULIN lignin is now being used to stabilize the best slow-break asphalt emulsions. It prevents reaction of calcium with rosin acid soaps used as primary emulsifiers, thus preserving dispersion of the asphalt in water, even in contact with calcium-bearing aggregate. INDULIN is the most versatile stabilizer available, being effective with all domestic and foreign asphalts. It has no harmful action on other properties of the emulsions and is easily added during manufacture. Lately the price of INDULIN has dropped as much as 33½%. As a result, it is being re-evaluated for various other uses. Write to Industrial Chemical Sales, Division West Virginia Pulp & Paper Company, 230 Park Ave., New York 17, for samples and more complete information.

SEA SALT FROM THE BAHAMAS—

This year 125,000 tons of sea salt will be produced by saltpan evaporation at Inagua, most southerly island of the Bahamas. This will be a continuing and increasing source for sea salt, and minimum 2,500 ton shipments are available for immediate delivery f.o.b. Inagua. Inagua sea salt is recommended primarily for the manufacture of chlorine, for use in meat packing, water softening and refrigeration. It is available in two grades: Coarse grade (particle size ½" down to fines, combined), Fishery grade (particle size ¾" down to fines, combined). For further information write C. Tennant Sons & Co., 100 Park Ave., New York.

IMPORTED IDEAS FOR BETTER IN-

DUSTRY—General Industrial Development Corporation, 270 Park Avenue, New York is the sole selling agent for Bamag-Meguini A.G. of Germany, and St. Gobain of France. Bamag offers a complete unit for the Wecker Process of distilling fatty acids and deacidifying oils and a new high pressure steam generator, with closed circulation of steam and condensate, which operates at 700°F. The latter unit aids in evaporating and distilling oils, varnish, glycerine, fatty acids, etc. St. Gobain has available a granulated nitrophosphate fertilizer process, in operation for the past eleven years where an acute shortage of sulphuric acid has altered manufacturing methods. Literature is available.

GLUCURONOLACTONE NOW OFFERED IN COMMERCIAL QUANTITIES—

The Chemical Division, Corn Products Refining Co. are now supplying commercial quantities of Glucuronolactone produced synthetically from D-glucose. Glucuronolactone is an important structural constituent of essentially all fibrous and connective tissues in animals, and is present in low concentrations in normal blood and urine. It is therefore of vital interest to all investigators of body processes, diseases and treatments. Until recently there has been available only limited amounts of Glucuronolactone produced by expensive and tedious biosynthetic procedures. Corn Products' survey of current literature on Glucuronolactone is now in booklet form and available from the company at 17 Battery Place, New York 4, N. Y.

STAUFFER CATALOG REVISED—

Stauffer Chemical Company has just issued a revised edition of their general catalog covering basic chemicals for industry and agriculture. The new 112 page book has been brought up to date to include all products currently manufactured by Stauffer, and the latest application available on all Stauffer chemicals. As in the earlier editions, complete data are given on all products, and numerous tables on specific gravity, viscosity, specific heat, solubility and other properties give valuable help to the chemist. For your copy, contact the company at 420 Lexington Ave., New York 17, N. Y.

GROW BETTER PLANTS WITH HORMONES—

Millmaster has a group of compounds available for regulating various aspects of plant growth. These 'hormones' make it easy, for instance, to delay fruit buds before frost and to prevent fruit, leaf, and flower dropping for a proper stage of ripeness at harvest, fruit scald, and sprouts growing on stored potatoes. Alpha naphthaleneacetic acid, alpha naphthaleneacetamide, sodium alpha naphthaleneacetate, the methyl ester of alpha naphthaleneacetic acid are effective plant hormones which can be used in sprays and vapors including aerosols, dusts, pastes, and emulsions. The recent development of fruit-setting and seedless products has been possible with such growth stimulators as beta naphthoxyacetic acid and 2,4,5-trichlorophenoxypropionic acid. More details can be secured from Millmaster Chemical Corp., 11 West 42nd Street, New York 36.

SAFETY SOLVENTS FOR SAFER

CLEANING—Caldwell Chemical Company is offering a group of Safety Solvents designed to do a more thorough and safe job of cleaning mechanical and electrical equipment. None of these solvents is for vapor-phase degreasing, but any may be used for practically all cold dip, brush, or spray cleaning. Because of their lower vapor pressures they last longer and are easier to use in degreasing small crevices, etc. Safety Solvents—mixtures of halogenated and aliphatic petroleum hydrocarbons—are less toxic due to this lower vapor pressure and less fire hazardous due to high flash points. Caldwell, 441 Lexington Ave., N. Y. will send technical data and samples.

"WHAT'S NEW" is prepared by the staff of The House of J. Hayden Twiss. The product developments and expansion programs reported here reflect the progressiveness of our clients whose advertising we strive to make technically informative, editorially interesting and psychologically persuasive. If further information is desired, please address your inquiry to "What's New" Editor, The House of J. Hayden Twiss, Advertising, New York Central Building, 225 Park Ave., New York 17, N. Y.



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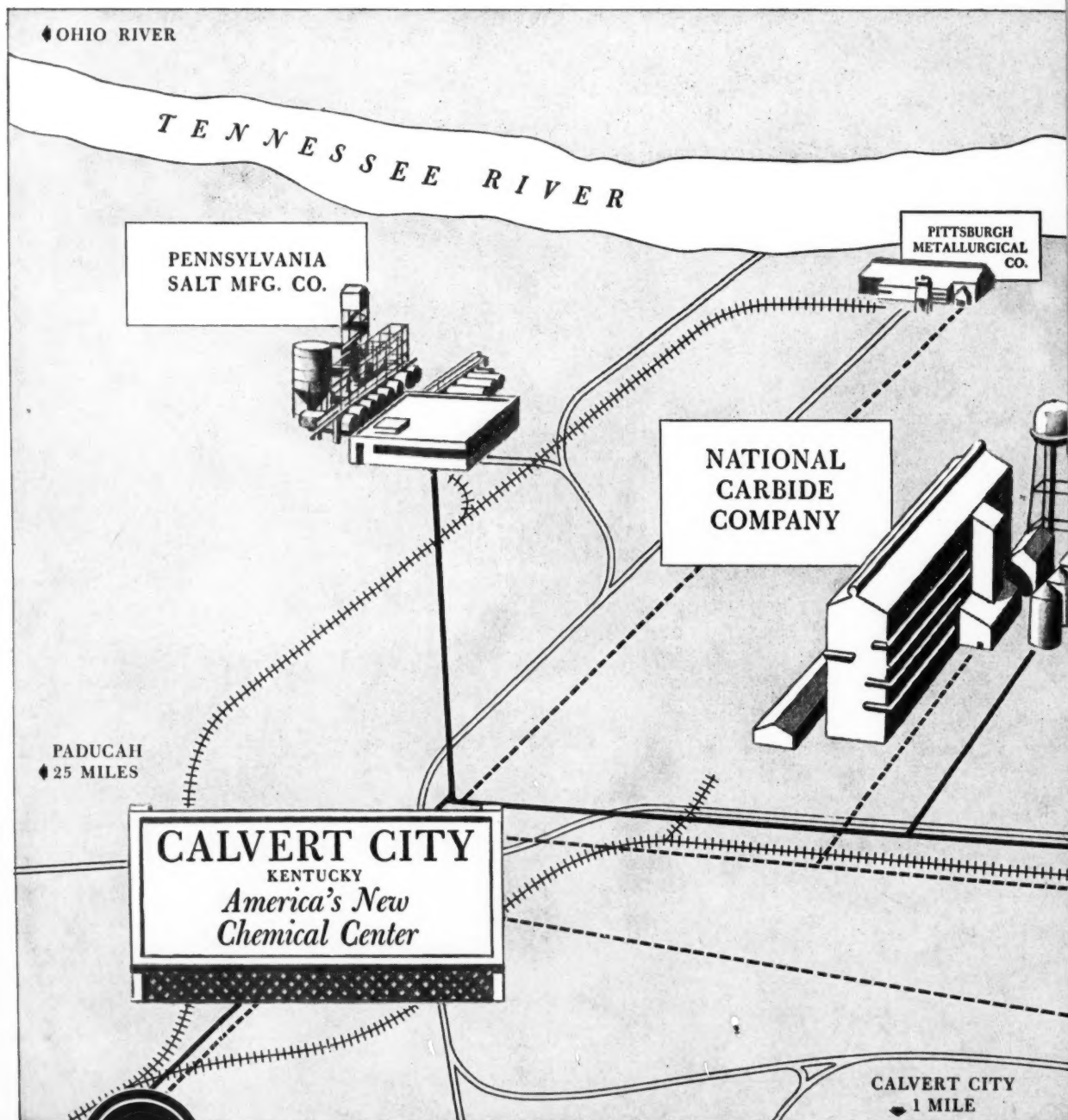
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Calvert City is the realization of the production executive's ideal in a chemical plant site. Located on the navigable Tennessee River and on the main line of the Illinois Central Railroad, Calvert City offers both water and rail transportation. Good

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APPROXIMATE CHEMICAL COMPOSITION	AAB %	ABL %	AB %	ABH %	AAAR %
Caproic C6	—	—	—	—	—
Caprylic C8	2.0	1.5	1.0	1.0	1.0
Capric C10	4.0	3.5	3.0	3.0	2.0
Lauroic C12	90.0	70.0	60.0	60.0	45.0
Myristic C14	2.0	13.0	10.0	10.0	22.0
Palmitic C16	—	0.0	7.0	7.0	11.0
Stearic C18	—	1.0	1.0	0.0	2.5
Oleic C18	2.0	3.0	7.0	3.0	11.0
Linoleic C18	—	—	3.0	—	5.5
Linolenic C18	—	—	—	—	—
APPROXIMATE CHEMICAL DATA	AAB	ABL	AB	ABH	AAAR
FFA	130-144	130-141	126-132	126-132	116-126
TITRE °C	37.0 Min.	30.0 Min.	24-28	29	30.0 Max.
IODINE VALUE	3.0 Max.	5.0 Max.	0-16	3.0 Max.	14-22
ACID VALUE	277-287	275-281	251-263	251-263	232-253
SAP. VALUE	277-287	275-281	251-263	251-263	232-253
COLOR	15.0/2.0	20.0/3.0	20.0/3.0	15.0/2.0	35.0/5.0

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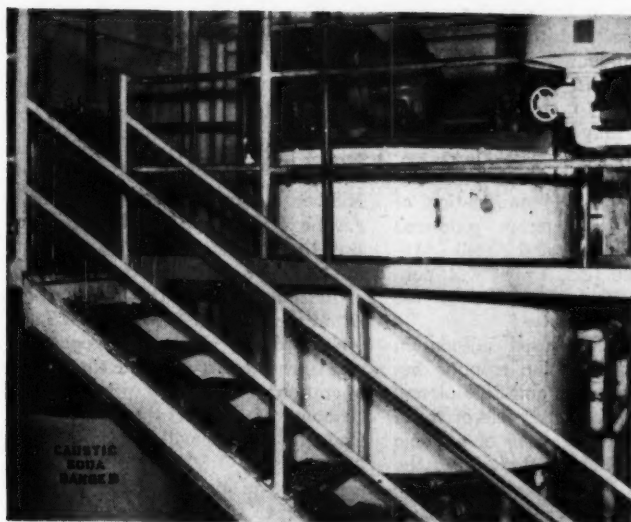
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PRODUCTION....



COPPERHILL PLANT: Inorganic integration forward . . .



PROCESS CONTROL PANEL: . . . leads to study of organic integration backwards.

Organics on Tap

Tennessee Corp. got more than it bargained for in its hunt for a sulfonation process. Looking for a new approach to the problem, it found it in a continuous process that—without additional processing—gives a product running 88-90% active ingredient. It also got the idea of branching out into organics.

For years, Tennessee Corp. has been producing basic materials, selling them to other firms that processed them further. Seeing its own markets as

a logical expansion step, the firm delved into the possibilities of making organic sulfonic acids and their derivatives.

As its first such product, Tennessee Corp. chose alkyl aryl sulfonates. The reasoning for this was twofold—there's a lush market for these surface active agents, and, too, the firm has an established position as a manufacturer of fertilizer, with the sulfonates finding application in that field as a curing agent.

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be glad to supply these materials,
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PRODUCTION

Under Wraps: At least for the time being, the firm is keeping the nature of the process and the capacity of the plant confidential. It says merely that the process is "designed to drive the sulfonation to essential completion, yielding only enough by-product sulfuric acid to produce 8-11% sodium sulfate in the neutralized products" and that it uses a "combination of sulfur-containing materials produced in its own adjacent acid plants." Anticipated production, it says, will "constitute a sizable percentage of the total output of industry."

The most widely used sulfonation process depends on the reaction between a hydrocarbon and 20% oleum. Only difficulty is that a mole of water is formed for every mole of sulfonic acid produced. The water dilutes the reaction mass, and as a result, a large excess of oleum must be used to maintain the proper pH.

If a salt content as high as 60% is allowed, the product can be neutralized as is. Otherwise, the mixture is cooled and the spent acid which settles to the bottom, is drawn off. But even so, the product contains approximately 15% salt after neutralization.

One way to get a product containing less salt (hence more active ingredient) is to sulfonate with sulfur trioxide, for then no water is formed. Ninol Laboratories (Chicago) is doing just that with a process (CW, Sept. 20, '52) that is currently being carefully eyed by industry. Ninol is using General Chemical's Sulfan stabilized sulfur trioxide. And it's no secret that a raft of other firms are researching along similar lines.

One possibility is that Tennessee Corp. is sulfonating with sulfur trioxide dissolved in sulfur dioxide. Both would be readily available from the firm's adjacent Copperhill sulfuric plant. But the company claims the clue to the process is not only due to a "unique combination of materials" but also to the "design of equipment."

In any case, Tennessee Corp. is supplying the sulfonate as the sodium salt, eventually plans to turn out the potassium, ammonium or alkanol-ammonium salts. Planned for the more distant future are heavy metal salts, like calcium and barium.

The material is sold either in the form of dry flakes or in a 30% aqueous slurry. It's white when dry, odorless and stable in acids and alkalis. It's claimed to have excellent foam characteristics and is compatible with a wide range of builders because of its low content of sodium sulfate.

The unusual twist in the whole proj-

ect is that the firm started out with the idea of utilizing its own products in its expanded production. It figures that the idea has been successfully realized, now is studying the possibility of making its own organics.

Best of Both

Neither a free piston engine nor a gas turbine can be classified as new. But the first successful combination of the two will be unveiled by Cooper-Bessemer Corp. (Mount Vernon, O.) at the upcoming (May 14th) Tulsa oil show. The new power-generating unit is expected to combine the smooth operation of a turbine with the fuel economy of the best diesels.

Cooper-Bessemer will display a model of its existing 1,500-hp. plant, which, says the firm, delivers twice as much power (per fuel unit) as a conventional unit, occupies from 30% to 60% less space, entails a savings on installation costs of from 10% to 25%.

Making It Go: Essentially, the free-piston engine is an internal-combustion engine. The difference is that it has no connecting rods or crank shafts, and two pistons—opposite each other in a single cylinder—do the job instead of the many pistons.

This is how it works: Fuel, ignited in the cylinder, forces the pistons apart. The moving pistons actuate air compressor pistons. They in turn direct air back through the cylinder.

Air scavenges the hot gases of combustion in the cylinder and the hot gases and air drive the turbine's rotor. Pistons are forced back to the firing position by an air cushion remaining in the cylinder at the end of the piston's stroke.

Cycling air through the cylinder lowers the temperature of the gases entering the turbine, enables the free-piston engine to operate efficiently at 1000 F—the same temperature as steam turbines, rather than the 1350 F temperature of conventional gas turbines. That means the turbine can be fabricated from materials normally available for civilian use.

C-B engineers point out that higher efficiencies are obtained from the free-piston engine because:

- The engine can take more energy from the fuel than can a rotary compressor turbine unit.
- The free-piston engine is its own prime mover. It runs itself with the hot gases as a by-product. No power is bled from the turbine as in the conventional turbine where the rotary compressor is driven from the engine's shaft.

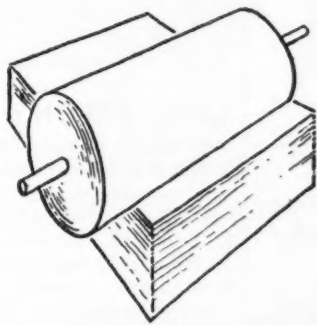
They say the efficiency of the free-



buying ammonia

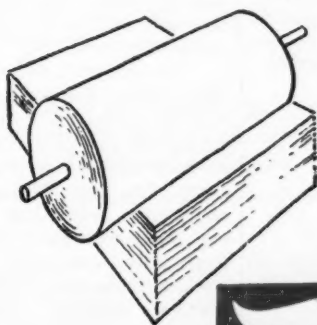
Waste disposal was a problem with a large pulp and paper manufacturing company. They changed to ammonium bisulphite cooking where they could recover much of the chemical value in the waste liquor . . . they found, in addition, the efficiency of the pulping operation was improved and the pulp was of better quality.

to better advantage



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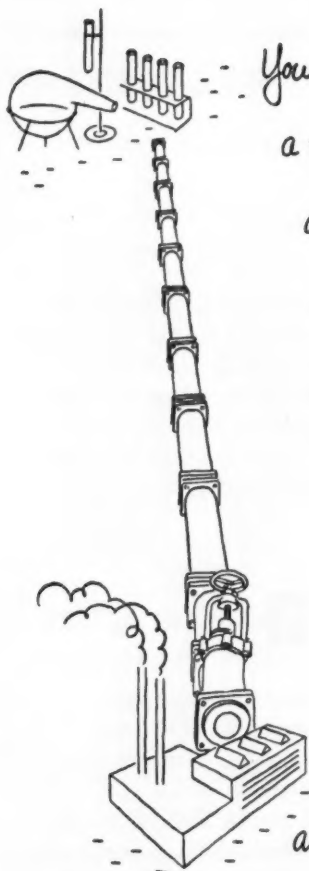
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45



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PRODUCTION

turbine engine is about 40% or just about double that of rotary-compressor turbines. And they report they can raise it by supercharging.

Where It Goes: Although C-B is not aiming the new generating unit for automobiles or as a replacement for big steam generating plants, it is taking direct aim at all other fields. It's long been a big supplier of power units to the petroleum industry, but is not overlooking others.

Medium and small electric generating stations are seen as a lucrative outlet. There, engineers figure, the free-engine gas turbine can be installed at a cost of \$182/kw., or about 25% cheaper than the cost of a conventional turbine. A play for stations with capacities of over 25,000 kw. is seen as something for the future.

At the same time, the firm cautions that it is not yet ready to sell any units. The one that has been produced and tested has proved out, but the firm feels that more field-testing is in order before it is ready to turn them out on a production-line basis.

EQUIPMENT

Automation: Massachusetts Inst. of Tech. (Cambridge) will offer a special summer program on automatic control, June 22-July 3. Prof. Donald P. Campbell will direct discussions on the analysis and synthesis of feedback control systems.

• **Instrumentation** goes international with the formation of Integra-Leeds & Northrup Ltd. (Birmingham, Eng.). Leeds & Northrup Co. (Philadelphia), manufacturers of automatic controls, and S. A. Integra (Liege, Belgium) created the English company to widen their base of supply, augment production of both parent companies' products.

• **Heavy-Duty Hose:** Compounded of rubber, reinforced with horizontally braided rayon cable cord and covered with thick-wrapped rubber, H. K. Porter Co., Inc. (Philadelphia) new, nonporous, heavy-duty air hose is now being made by its Quaker Rubber Corp. Div. Designed to withstand working pressures of 450 lbs./sq. in. without "snaking," temperature of -40 F while remaining flexible, and weather-checking and oil, the hose is available in lengths up to 50 ft. with inside diameters of 3/8 to 2 in.

• **Image Intensifier:** Said to produce images 800-1,200 times brighter than those obtained with conventional fluoroscopes, a new X-ray image amplifier will soon be available from North



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Acid Number	204 to 209
Iodine Number	1.0 Max.
Saponification Number	205 to 210
Average Molecular Wt.	268 to 274
Specific Gravity @ 100/25°C	0.834
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PRODUCTION

American Philips Co., Inc. (Mount Vernon, N.Y.). Original development was by Philips Laboratories, Eindhoven, Holland.

Skull Safety: Willson Products' (Reading, Pa.) has come out with two new safety helmets (one model lighter than the other), molded in one-piece lightweight plastic. They pass all required tests for impact-resistance, pierce-resistance and dielectric strength, are said to be resistant to many industrial acids and bases.

Low-Volume Pump: Yeomans Brothers Co.'s (Melrose Park, Ill.) Pneu-Pump is a simple pneumatic ejector claimed to be capable of handling low volumes with high efficiency. Having only one moving part, a ball inlet valve, the pump is designed to carry compounds ranging from acids to mud.

Self-Contained Scales: A new line of self-contained, portable, hydraulic weighing units is now available from the A. H. Emery Co. (New Canaan, Conn.). Averred accurate to 0.1% of scale, the units are marketed in 24 ranges from 0-500 to 0-100,000 lbs.

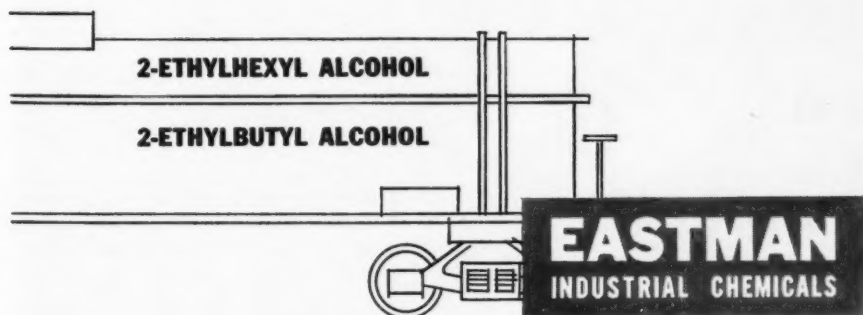
Resinite Tubing: Precision Paper Tube Co. (Chicago) recently developed a line of resinite tubing said to provide good tensile strength, dielectric and chemical resistance. Produced in many shapes, widths and lengths, the tubes come with inner diameters ranging from .125 to 3 in. and wall thicknesses from .006 to .100 in.

Pony Power: Designed to meet a growing need for low horsepower adjustable speeds, Reliance Electric & Engineering Co.'s (Cleveland) V^oS, Jr. is a new electronic-type variable-speed drive that will provide stepless adjustable speeds from ac. currents in the ¼ to 3 hp. range.

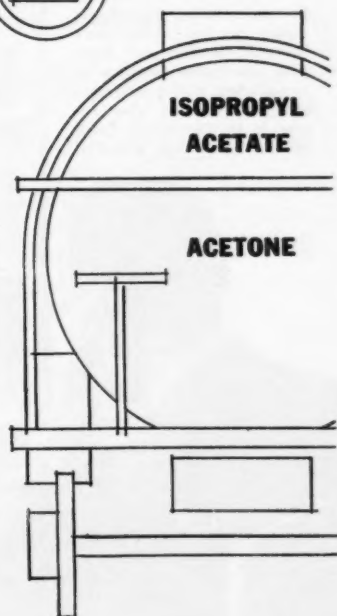
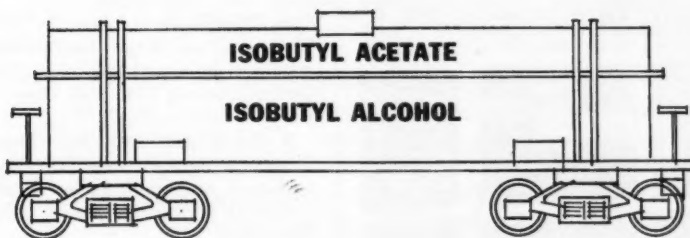
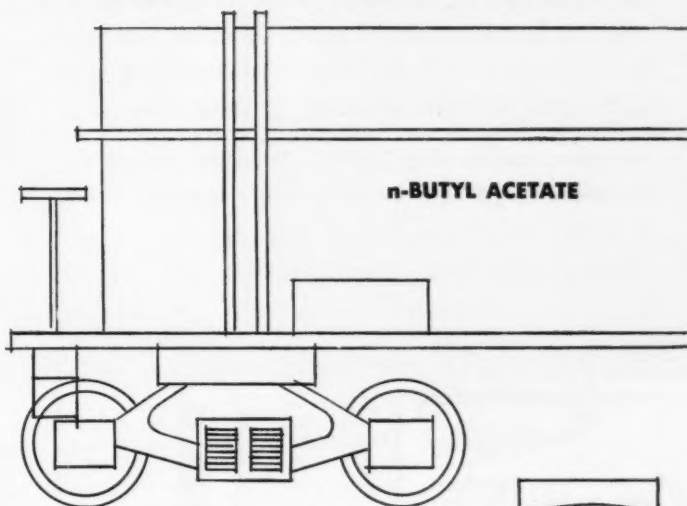
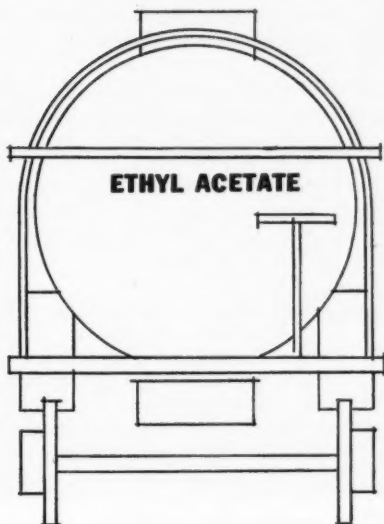
Pump Switch: Detroit Harvester Co. (Detroit) recently transferred its Pioneer Pump Div. manufacturing operations from Detroit to Paris, Ky.

Custom Corrosion: Kenneth Tator Assn. (Coraopolis, Pa.) has just established a custom corrosion testing service for numerous industrial exposures. Test stations are located in large industrial plants where different products are studied under exposure to acids, bases, salts, solvents, moisture, mildew, heat and other conditions.

Vapor Ballast: Pumping condensible



solvents



These products are stored in bulk at Kingsport, Tennessee and Lodi, New Jersey by Tennessee Eastman Company and in Chicago, Illinois and St. Louis, Missouri by DeMert & Dougherty, Incorporated.

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St.; **West Coast:** Wilson Meyer Co., San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.

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CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE

Sales representative for **TENNESSEE EASTMAN COMPANY**, division of **EASTMAN KODAK COMPANY**

...not a "TEST" market!

"... no, sir, not at all. This is a **TESTED** market ... ready for distribution plans **NOW**. It's ideally situated to be the hub of our distribution to the whole area."

Yes, Oklahoma is tested and ready to become your Southwestern distribution center. Within overnight transportation distance, Oklahoma offers (1) 37 million people with (2) an annual income of over 50 billion dollars; and who buy goods from (3) 433,000 retail establishments to the tune of (4) 34 billion dollars every year!

Adequate warehousing facilities, intelligent, adaptable labor and fast, adequate transportation services complete the picture for low-cost, high efficiency distribution—from Oklahoma.

OKLAHOMA

Write—Cler Langston, Director
State Capitol Bldg.
Oklahoma City, Okla.

For an accurate, confidential report on how Oklahoma's strategic location will meet your distribution needs, write immediately, giving details of your requirements. Your future is in Oklahoma! Come on in. The markets are fine!



PRODUCTION

vapors is no longer a problem, declares National Research Corp. (Cambridge, Mass.). The solution is the NRC Rotary Gas Ballast Pump, a mechanical high vacuum unit that NRC imports from E. Leybold's Nachfolger (Cologne, Germany) and to which NRC adds American motors, pulleys, flanges and controls. The trick is in keeping vapor pressures below condensation pressure by bleeding a small amount of air into the pump after intake has been completed and as compression is about to occur.

Out of the Cellar: From the founder's basement to a spanking-new structure with over 20,000 sq. ft. of floor space in little more than 10 years is Eriez Manufacturing Co.'s (Erie, Pa.) latest point of pride. The makers of magnetic separators have just moved into their new home.

New Moves: Westinghouse Electric Corp. (Pittsburgh) has just opened a San Francisco branch office to provide better service to Nevada and California customers.

- Allis-Chalmers Manufacturing Co. (Milwaukee) recently combined various district and branch offices into the Rocky Mountain Region with headquarters in Denver.

- American Smelting & Refining Co. (Barber, N.J.) has appointed Troy Belting & Supply Co. (Troy, N.Y.) as a distributor for Asarco's bronze alloy rods, tubes and shapes.

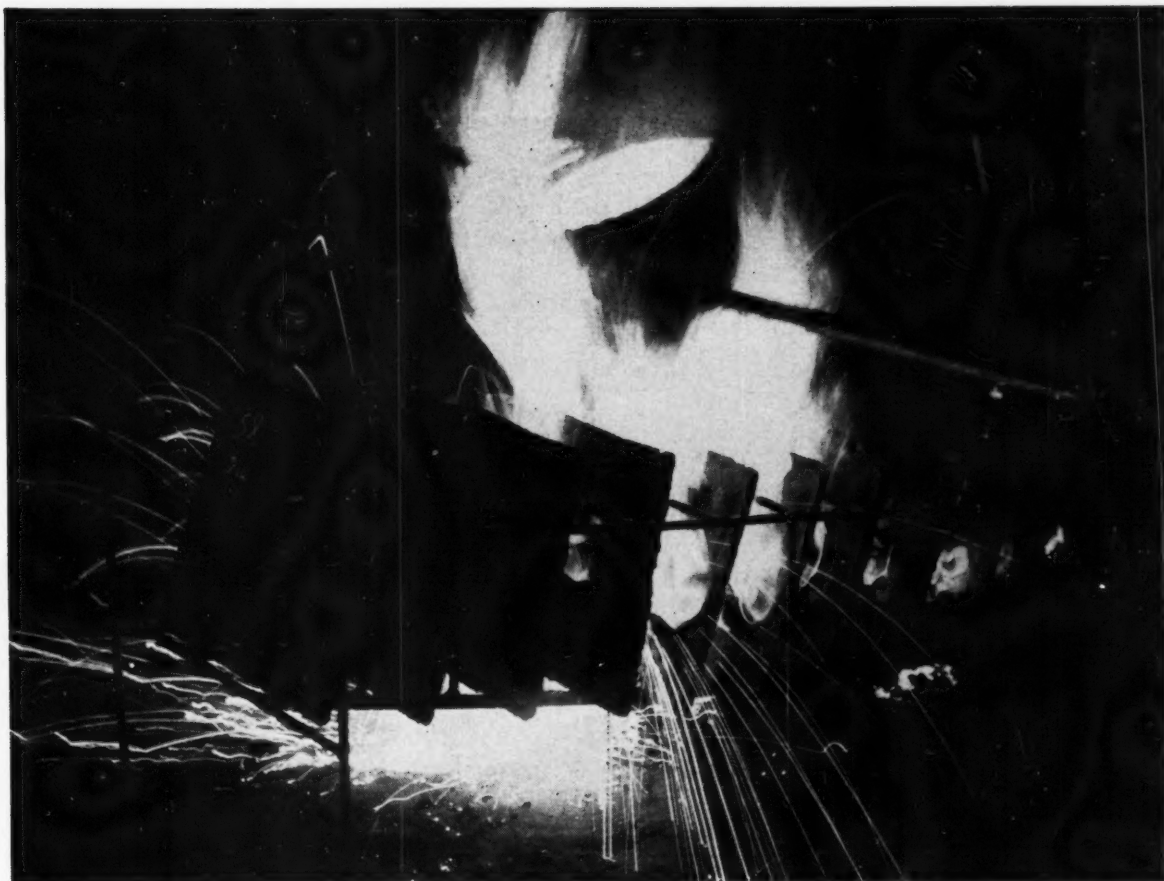
- Owens-Illinois Glass Co. (Toledo, Ohio) will sell Kaylo heat insulating products on a national basis through Owens-Corning Fiberglas Corp. (Toledo).

- Orr & Sembower, Inc. (Reading, Pa.), manufacturers of Powermaster packaged automatic boilers, will relocate its Cleveland district office in Chicago.

Centrifugal Pumps: A complete line of corrosion resistant sanitary and industrial centrifugal pumps is now being offered by Tri-Clover Machine Co. (Kenosha, Wis.). Available in capacities up to 1250 gpm. and 250 ft. of head at zero gpm., the pumps are designed to handle any liquid that will flow to them.

Late Lists: Metalab Equipment Corp. (Hicksville, L.I., N.Y.) recently published catalog 4B covering its long line of laboratory equipment.

- And also fresh off the press is Lincoln Engineering Co.'s (St. Louis) catalog 40 detailing Lincoln's material dispensing equipment.



Photograph by courtesy of The Cooper Alloy Foundry Co.

Here's a close-up view of one of the most closely-guarded industrial secrets in years: Shell Molding. This picture shows the pouring operation at The Cooper Alloy Foundry Co., Hillside, N. J.

Can HCHO Remold The Foundry?

The most exciting foundry technology news in many years has been the recent announcement of a revolutionary new process called "Shell Molding." Like so many ideas that have proved revolutionary, "Shell Molding" is, basically, a simple idea.

The key to this new process is a thin mold of sand called a "shell mold." Molten metal is poured into this mold as shown in the picture above. The binder used to hold this sand together is phenolic resin. By adding just five percent phenolic resin to sand, this revolutionary new process became a reality.

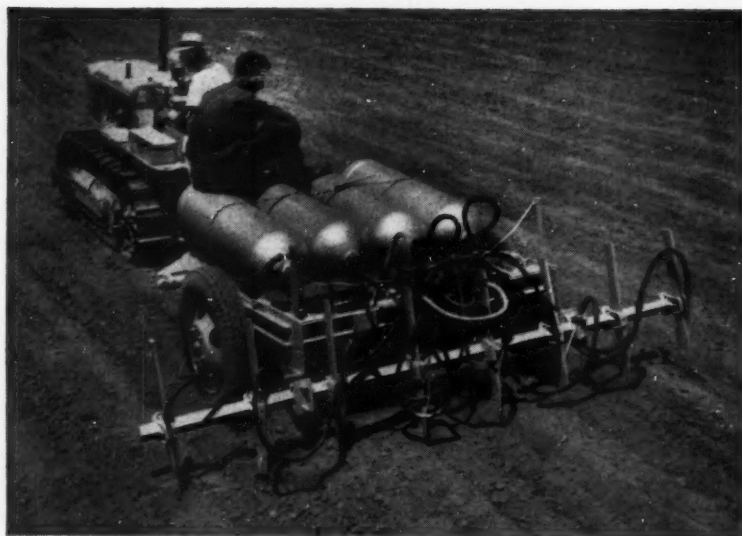
As a supplier of HCHO used to prepare phenolic resins, Spencer Chemical Company has been intensely interested in this new foundry development. Formaldehyde . . . phenolic resins . . . shell molding. It's one more example of the limitless frontiers of chemistry; an inventive triumph so revolutionary that it may not only remold the foundry, but may actually remold an industrial way of life.

SPENCER PRODUCTS: Anhydrous Ammonia • Refrigeration Grade Ammonia • Aqua Ammonia • Methanol
Formaldehyde • "Mr. N" Ammonium Nitrate Fertilizer
SPENSOL (Spencer Nitrogen Solutions) • 83% Ammonium Nitrate Solution • FREZALL (Spencer Dry Ice)
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Works: Pittsburg, Kan., Henderson, Ky., Chicago, Ill.,
Charlestown, Ind., and Vicksburg, Miss. (Under construction.)



AMMONIA INJECTOR: Farmers like their nitrogen neat, so producers fall in line.

Spreading Ammonia

Amidst general farmer buying lassitude, demand for anhydrous ammonia is insistent and growing.

Midwest corn growers are the latest to lend their voices to this ammonia chorus.

Producers, although preferring to sell solid-form nitrogen, are building apace to give the farmer what he wants.

Table I
Anhydrous Ammonia for Direct Application

Season	Consumption * (In short tons of nitrogen)	Per cent increase over previous year
1947-48	43,373	
1948-49	69,596	60
1949-50	85,516	23
1950-51	118,423	39
1951-52	168,273	42
1952-53 (est.)	255,000	51

* National Fertilizer Assn. figures

Table II
Ammonia in the News

Who	Where	What
Allied Chem. & Dye	La Platte, Neb.	\$25 million ammonia/urea
American Cyanamid	New Orleans, La.	\$55 million ammonia, et al.
Ammonia Chemicals	California	100 ton/day projected
Atlantic Refining	Point Breeze, Pa.	100 ton/day capacity
Brea Chemicals	Brea, Calif.	\$13 million
Cities Service	St. Louis, Mo.	\$5 million
Commercial Solvents	Sterlington, La.	\$20 million ammonia/methanol
Deere & Co.	Pryor, Okla.	\$18 million ammonia/urea
W. R. Grace	Memphis, Tenn.	\$19 million ammonia/urea
Hooker Electro-chemical	Tacoma, Wash.	\$2 million
Lion Oil	Luling, La.	\$31 million ammonia/ammonium nitrate
Mississippi Chemical	Yazoo City, Miss.	\$4.75 million ammonia/ammonium nitrate
Pennsalt	Wyandotte, Mich.	\$2.2 million
San Jacinto Chemical	Texas	50% anhydrous ammonia expansion
Shell Chemical	Ventura, Calif.	150 ton/day capacity
Std Richardson	Pointe a La Hache, La.	\$19 million
Spencer Chemical	Vicksburg, Miss.	\$14 million

Right now the farmer is pretty cagey about investing in agricultural chemicals; he has been decidedly sluggish in responding to the paternalistic advice (CW, Apr. 4) of government and industry associations on purchases of yield-boosting fertilizers.

But one striking exception to this buying indifference is the apparently insatiable demand for nitrogen-providing plant food. And of the several forms of nitrogen-for-fertilizer chemicals, the fastest growing is direct-application ammonia.

For the 1952-53 season, the U.S. Dept. of Agriculture is predicting an average 16.5% rise over last year for all crop nitrogen demand. At the same time, direct application ammonia (largely anhydrous) is slated for a spectacular 51% lift.

No one-time flash, anhydrous ammonia is moving along at a faster-than-ever clip. How it has grown since 1947, when the idea took hold in the Mississippi area, is shown in the consumption figures in Table I.

California Cradle: Use of anhydrous ammonia dates further back, of course. As early as 1934, Shell Chemical was introducing ammonia into irrigation water to feed the lush California crops.

Dry soil injection was established on a commercial scale by Shell in 1943, five years after researcher F. H. Leavitt conceived of the possibility.

The direct ammonia application, now firmly established in California and Mississippi, is spreading over large sections of the country. In the East, for example, Suburban Farm Service Co., Whippany, N.J., in 1950 decided its LP-Gas equipment, largely idle in summer, was a "natural" for supplying farmers with anhydrous ammonia during the growing season.

And within the past four-five months, demand from the Midwest has developed at what one supplier terms a "sensational" rate. Odds are that in the next couple years the corn country will display an appetite for anhydrous ammonia that will put even California and Mississippi in the shade.

A recent development, not fully proved yet, which may expedite this Midwest boom: ammonia is applied to the soil as soon as the temperature drops below 60 F, to lie "dormant" there until the warm spring weather re-activates nitrogen-converting bacteria.

Many farmers are already convinced that given favorable soil conditions, ammonia may be applied in late fall



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April 25, 1953 • Chemical Week

53

IN STORAGE...

OR IN TRANSIT...



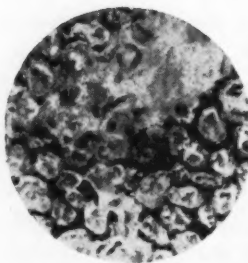
SIMPSON MIXED MATERIALS

STAY MIXED

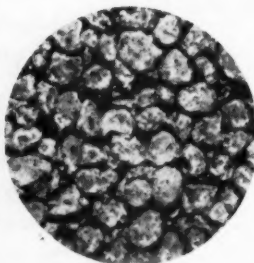
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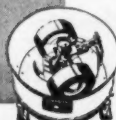


(LEFT) Conventionally mixed material showing typical smears of unmixed materials. (RIGHT) Simpson mixed material showing complete uniformity of mix — which will remain in that form even in transit, or after long storage periods.



SIMPSON MIX-MULLER DIVISION

NATIONAL ENGINEERING CO. (Not Inc.)
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MARKETS.

for early spring seedlings in areas as far south as central Arkansas.

But Myron S. Anderson, senior chemist and specialist in this field at USDA's Bureau of Plant Industry, Soils, and Agricultural Engineering, qualifies this view. Although agreeing on the general principle of direct ammonia application and acknowledging that growth of the method is merely a "matter of economics," Anderson points out that persistence of ammonia in soil is not well known, will make no recommendations as to time of application.

Headaches: The "dormant" discovery, if substantiated, may lengthen the present five-month application season, help ease a big headache for suppliers—the problem of storage during off-season.

Complicating the storage question are the special rules and regulations governing ammonia in most states. Examples: unprotected above-ground containers must be designed for pressures of 250 lbs./sq. in.; protected storage (i.e., in a shed or with sprinkler system) must carry 200 lbs./sq. in. rating.

To clear this storage hump, ammonia producers have been making two approaches:

- They are contracting with distributors to supply uniform monthly shipments, thereby shifting much of the huge storage burden to the dealers. Since a well-run ammonia distributorship can pay off handsomely, this storage job may not be too onerous to the dealer.

- Makers are also trying to smooth operations by setting up their plants to switch to methanol production during the ammonia off season.

Besides the storage problem, other aspects of anhydrous ammonia application are not all peaches-and-cream, either. That farmers benefit from this cheapest-of-all nitrogen is, of course, patent. But the farmer has few of the headaches associated with direct ammonia application.

For, in most cases, this modern fertilization method is a specialized business. Using recently developed devices (see picture), the operator must feed the ammonia into the soil to just the right depth and then immediately cover the spot. However, having learned the proper technique, an experienced hand can do the trick and lose very little ammonia by evaporation into the air.

On the West Coast, Shell always has done the job from start to finish. The farmer pays for his ammonia on a laid-down basis, owns none of the

NEVILLE

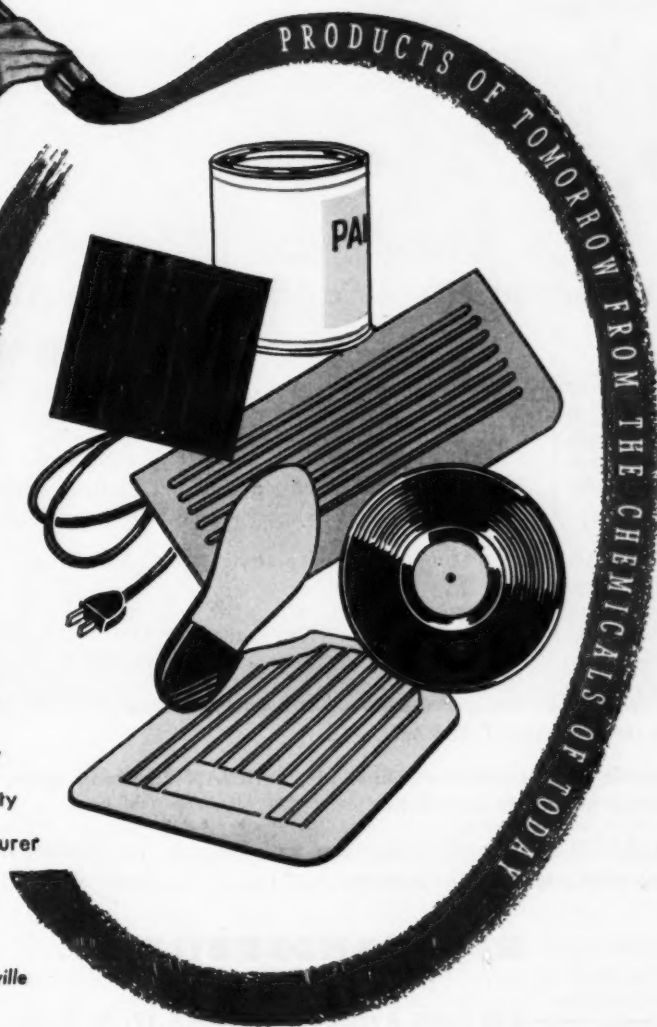
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When the woman of the house applies a new coat of aluminum paint to a radiator, or walks on mastic or rubber floor tile, or steps down to the basement on rubber stair-treads . . . she unconsciously proves the worth of Neville Resins! For it's these modern resins that add long life and wear to countless every-day household items, to say nothing of extra beauty and sales appeal so necessary to the manufacturer of such products.

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C5



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New Bulletin C13, just off the press, explains how DARVAN dispersing agents keep finely divided solids dispersed in water. It explains how very small amounts of DARVAN are effective in breaking down flocs and agglomerates into their ultimate particles.

DARVANS are dispersing agents, not wetting agents. They do not appreciably affect surface tension.

DARVAN disperses particles so completely that greater surface area is exposed. Therefore, the active ingredients in dispersions with DARVAN are more effective.

High solids content pastes that ordinarily are stiff can easily be made free flowing by the addition of DARVAN.

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POSITION _____

(Please attach to, or write on, your company letterhead.)

MARKETS.

equipment, does none of the work.

In the East, although no producer is reported as doing the complete job, distributors such as Suburban are stepping into the picture, delivering "packaged" applications.

Self-Help: On the other hand, if a farmer has large enough acreage and is ambitious to save still further, it's his privilege to buy his own equipment (for perhaps \$1,000 up, tractor not included) and make the applications himself.

Figures show that if a farmer in the Mississippi region plans to fertilize more than 50 acres with more than 56 lbs./acre of nitrogen, it might pay him to buy his own equipment, use direct anhydrous ammonia.

Different conditions and requirements change the minimum amount of land that a farmer can economically treat himself. For the Midwestern operator, the size of the "break-even" unit may be necessarily larger than it is in the Mississippi area. In the corn belt, for example, USDA says that a farmer should have 100-250 acres before considering buying his own equipment. In quantity of chemical, that means if a farmer plans to use more than 10,000 lbs. of nitrogen annually, it would probably pay him to apply the anhydrous ammonia himself.

Aim to Please: Several ammonia makers are already seeing to it that the new Midwest farmer is not neglected. Phillips, Lion, Mathieson and Spencer are reported giving the region increasing attention.

And they'll have even more intense competition later on: Deere (see Table II) is planning to establish itself in Oklahoma. Allied, in Nebraska, will be right on the spot, too, with its ammonia.

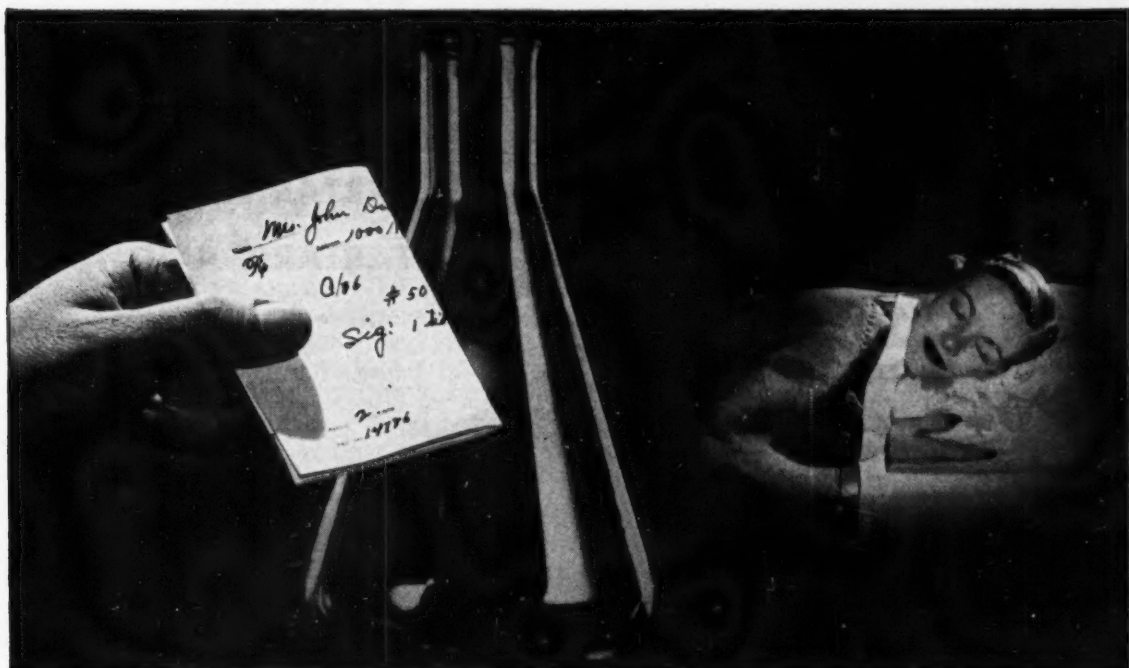
Just when the producers will catch up to demand is a wide-open question; that they're out to blanket the market as fast as possible is clear. Since early last year there's been a rash of new ammonia projects, some of the more prominent of which are listed in Table II.

Producers, however, have eyed this spread in direct ammonia application with mixed emotions. Reason: anhydrous ammonia is a relatively low-profit item; for nitrogen compound manufacturers. Selling it as such gives them no opportunity to establish greater values (and profits) through upgrading the ammonia to combined forms such as the nitrate.

But because competition, as well as demand, is rising, producers have little alternative but to give the farmer what he wants, even if his taste runs to lowly anhydrous ammonia.

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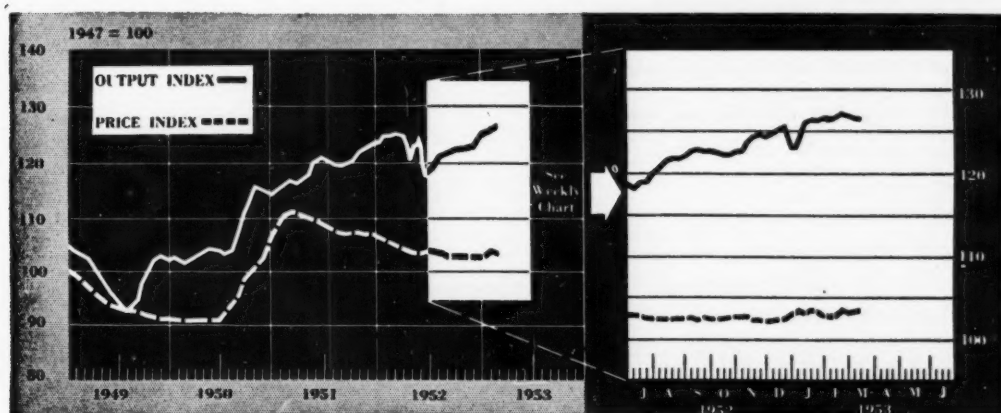


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MARKETS



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

Next week—April 30th, to be exact—the International Materials Conference will be minus one of its hardest working groups. On that date the Sulfur Committee will be dissolved.

The action comes as no surprise to trade observers who have been reading signs of the impending dissolution since early this year. In January the committee kicked around the idea of ending international crude sulfur allocations, hedged, then compromised by recommending controls for three—not the usual six—months.

Then last month the group completely ended allocations, predicted “reasonable prospects” for a balance between sulfur supply and demand for the remainder of 1953.

The Office of International Trade is apparently swinging over to the same point of view. Last month it set second quarter allocations on crude and refined sulfur for export, explained “U.S. sulfur supply position does not warrant unrestrictive export.”

But by this week OIT is easing some sulfur export controls. The quota for agricultural sulfur is boosted to 30 million lbs. (sulfur content); quota restrictions on formulations are completely dropped and licensing is placed on an “open-end” basis.

Reason advanced by the agency for the relaxing: generally “favorable” sulfur supply situation.

Not favorable by a long shot is the polyethylene supply position at the moment. Fact is, most users are finding it unusually tight.

Despite the shortness, however, one major producer just knocked 3¢/lb. off the price of most of its polyethylene resins and compounds—the second cut in seven months. The new reduction pegs prices for resins at 44¢/lb. in truckload quantities; 45½¢/lb. for 10,000-lb. lots to a truckload; 62¢/lb. for lots under 200 lbs.

Will glycerine prices go up or come down? That’s the question being bruited about in this particular market. Some trade-wise observers are pointing to two factors that may exert an upward pressure:

- Impending seasonal slack-off of domestic production (soapers’ normal vacation shutdowns coming up).

MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	126.5	126.6	123.5
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.5	104.6	103.3
Bituminous Coal Production (daily average, 1,000 tons)	1,404.0	1,334.0	1,343.0
Steel Ingot Production (1,000 tons)	2,238.0 (est)	2,228.0 (act)	
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	251.1	252.1	227.9

MONTHLY INDICATORS — Wholesale Prices

(Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	113.4	113.1	113.8
Chemicals and Allied Products	104.2	103.6	105.2
Industrial Chemicals	113.9	113.1	117.0
Drugs and Pharmaceuticals	91.6	91.4	93.1
Fertilizer Materials	112.8	112.7	109.6
Oils and Fats	59.0	52.7	47.3

• Definite possibility of easing imports—the high rate reached by glycerine importation (an estimated 10 million lbs.) during the first quarter is not likely to continue. There just isn't that much material abroad, says one expert.

On the other side of the fence, a few equally astute glycerine followers are laying odds that prices will remain where they are—conceding, however, that the current snugness of crude will prevail for awhile.

Each week brings a few more price "adjustments." But the traditional supply-demand factor seems to have taken a back seat as prime adjuster for changed chemical schedules.

Behind most higher chemical prices these days are increased manufacturing costs (raw material, labor, freight), and producers are hiking tags regardless of market conditions.

For instance, phosphoric anhydride schedules were upped a 1/2¢/lb. last week. Reason: rising labor, power, transportation costs over last year.

The advance pegs l.c.l. price at 15 1/2¢/lb. (in drums); a penny more than that in smaller packages.

The increases vary, of course, for different items, though the reasons are somewhat similar. Sodium cyanide solution prices are now 1¢/lb. higher (to 15 1/2¢) in tank trucks; ammonium oxalate has just been nudged upward 1 1/2¢ to 26 1/2¢/lb.

But calcium gluconate users are paying a nickel more per pound. New price to the medicinal, pharmaceutical trade, 63¢/lb. (150-lb. drums).

Meanwhile the domestic metal markets continue to suffer from an overdose of "foreign price-itis." Last week custom smelters were selling copper at 30 1/2¢/lb. (Conn. Valley)—down by 1 1/2¢ from a previous 32¢/lb.

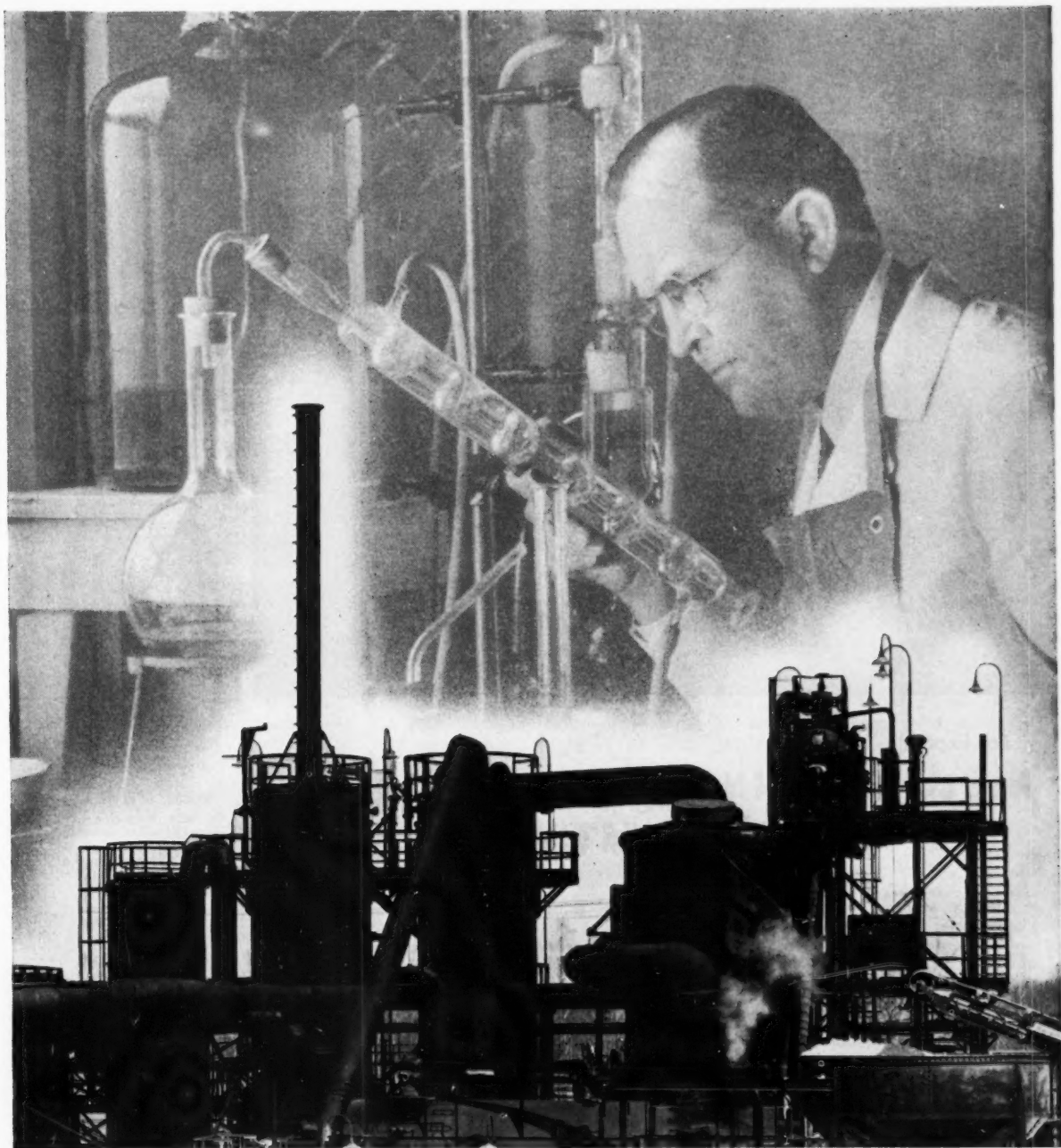
Behind the action: reported offerings of Belgian Congo copper at 30¢/lb. (N.Y.)—a 2¢/lb. decline from earlier tags. In the face of such soft prices, observers here are terming the Chilean government's insistent hold-outs for 36 1/2¢ "surprising." Especially since some are predicting a 27¢/lb. figure in the not too distant future.

And a weaker London market pressured lead prices here down another 1/2¢/lb.—the third cut in two weeks. Current quote: 12¢/lb. (N.Y.) But there's an optimistic undertone that domestic demand will soon exert a firming counter-pressure.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending April 20, 1953

UP		Change	New Price			Change	New Price
Phosphoric anhydride, drms., l.c.l., f.o.b., plant		\$.005	\$.155	Benzol, pure, nitration, Pitts., gal.		\$.035	\$.40
DOWN		Change	New Price			Change	New Price
Tin tetrachloride, anhyd., drms., wrks.		\$.10	\$.79	Tallow, fancy bleach., dlvd.		\$.0025	\$.0475

All prices per pound unless quantity is stated.

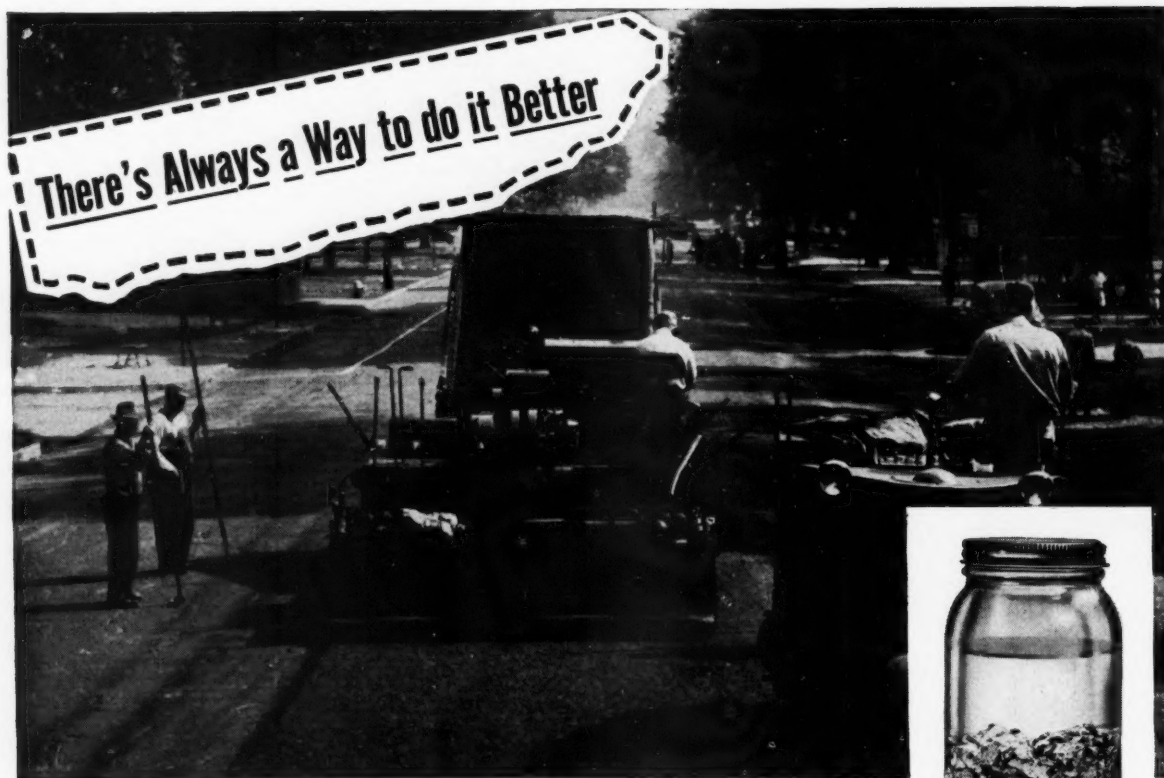


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April 25, 1953 • Chemical Week



For Example:

Nopco* BONDING and SIZING AGENTS make things that should stay put, stay put

Perhaps nothing exemplifies things that should "stay put" better than asphalt. Thousands of miles of roadway depend on its durability. Roadbeds rapidly deteriorate when the asphalt fails to bond properly to the aggregate. However, incorporation of a Nopco bonding aid in the asphalt instantly develops a tenacious permanent bond between cut-back asphalt and aggregate even if the stone is wet. Thus roads can be laid in rainy or inclement weather.

In the production of asphalt shingles and tile this same Nopco aid gives better bond between asphalt and fillers, increases strength and gives a smoother surface.

In a very different field, that of textiles, Nopco chemical agents are again found helping to

make things "stay put". For example, both natural and synthetic fibers must be sized before weaving, so that they are capable of withstanding the friction encountered on looms. Application of specially developed Nopco warp sizes, for natural and synthetic yarns, assures firm, yet flexible, coating over each individual thread to protect it from abrasion.

Perhaps *you* are looking for a high-performance bonding aid, or sizing agent, that will better an item you produce. If so, profit by consulting with us. Or, if you require some other processing chemical, let us have your specifications. We'll gladly make recommendations and work closely with you—putting our wealth of experience, modern facilities, and nationwide distribution set-up at your service.

* Reg. U. S. Pat. Off.



WITHOUT BONDING AID
24 hour immersion test illustrates almost complete stripping of RC-2 cutback Asphalt from wetted Massachusetts Rhyolite.



WITH NOPCO BONDING AID
24 hour immersion test shows virtually no stripping of RC-2 cutback Asphalt from wetted Massachusetts Rhyolite.

Outstanding NOPCO Processing Chemicals include:

EMULSIFIERS • LUBRICANTS
PLASTICIZERS • SIZES • DETERGENTS
DISPERSING AGENTS • METALLIC SOAPS
SURFACE TENSION REDUCING AGENTS
DEFOAMERS

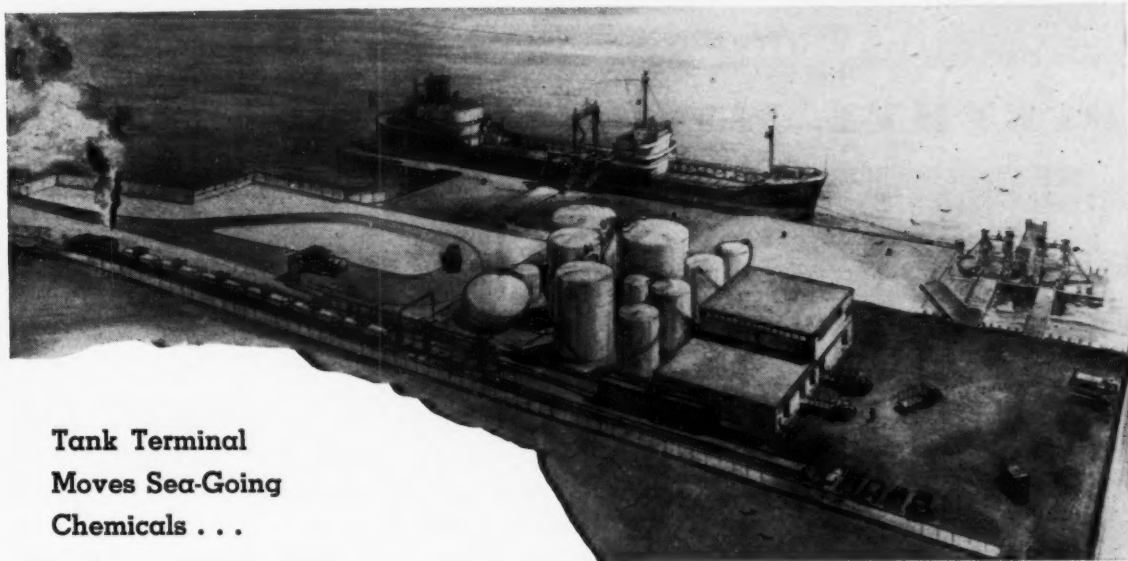


NOPCO

CHEMICAL COMPANY (Dept. CW) Harrison, N. J.

Branches: Boston • Chicago • Cedarstown, Ga. • Richmond, Calif.

DISTRIBUTION



**Tank Terminal
Moves Sea-Going
Chemicals . . .**

From Shipside to Railroad Siding

Starting early next month, bulldozers, pile drivers, and harbor dredges will converge at the foot of industrial Ingham Street in Bayonne, N.J. And a few months later, the artist's conception above will be off the drawing board and a reality. Significantly, the chemical industry will have what is reportedly the first integrated, versatile marine terminal built specifically for ocean-going chemicals.

Designed for Lehigh Warehouse & Transportation Co. by Newark's Engineers Company, Inc., the new public unit will be a major addition to Dow Chemical's Texas-to-Eastern-Seaboard distribution chain. But Lehigh doesn't consider itself tied only to Dow's high-flying kite. "We're building a commercial terminal," says one Lehigh official, "and we'll add to it as fast as needed to keep pace with chemical shipments into this area."

The same sentiment is echoed around the corner of Staten Island at the giant Carteret tank farm of General American Transportation Corp. "Counting solvents and aviation gasoline, we're 70% chemical now," boasts a GATX executive. "The way things are going, it'll hit 100% soon." With a tank capacity of 80 million gal., GATX's "100%" means an ocean of sea-going chemicals.

Typical of the Carteret development is the allocation of two GATX 3.4-million gal. tanks exclusively to methanol—understandable because it appears to be the top chemical com-

modity now tankered up the seaboard. Du Pont—using the *Polarus Oil*—ships to Carteret from Orange, Tex. For Celanese and Commercial Solvents, the Chemical Tankers Inc.'s *Otco New York* delivers methanol from Corpus Christi and New Orleans. And the same chemical is a regular part of the cargo for Carbide and Carbon's *Wilson*.

Methanol is not the only sea-going chemical, however. Into the New Haven, Conn., terminal of the *Excello* Corp. comes formaldehyde from Texas; Celanese uses the *Excello* for this movement. C&C's *Wilson* carries glycols and other alcohols. Chemical Tankers Inc. says it is enjoying a satisfactory volume of "spot deliveries" to various North Atlantic ports.

But for sheer variety, Dow chemical stacks up as a leading proponent of chemical tanker shipments. It's this variety that underlies Dow's decision to use Lehigh's new bulk-terminal venture.

Coordinated Tanks: The terminal will serve as one of the discharge points for Dow's *Marine Chemist* and a new chemical tanker being built by Bethlehem Steel at Quincy, Mass. Both ships are owned by Marine Transport Lines and will be operated between Dow's Texas Div. plants at Freeport, Tex., and East Coast terminals.

Although Bethlehem is keeping mum on details of the new vessel, reports are that it will be a 16,000-ton

ship with tailor-made tanks for a predetermined number of key commodities.

Information concerning the vessel is transmitted through Dow and Lehigh to the terminal designers at the Engineers Co. The aim: to have the shore tanks match the ship's tanks in terms of capacity, unloading rate, and pipe connections. When the new vessel ties up at the Bayonne pier, it will immediately be an integral part of the terminal operation. Six different chemicals can be unloaded simultaneously, and—if Dow's sales department has correctly forecasted—they will be pumped into storage tanks that are all pleasantly empty.

Lehigh's ex-All American football player, John F. Monahan, Jr. will be in charge of the terminal. As a former Lehigh salesman, the odds are that he will be pushing for new customers for his chemical distribution center. Specialized storage tanks will be built for such newcomers. For the present, Monahan's Dow-based tank farm has a 3-million gal. capacity for these chemicals coming from Dow's Texas plants: 73% caustic soda, chloroform, carbon tetrachloride, ethylene glycol, perchlorethylene, and methylene chloride.

Nickel-clad, steam-heated tanks will be used for the caustic, and a pressure vessel is planned for the methylene chloride. The other four chemicals will be kept in carbon-steel tanks of conventional design.

KAY-FRIES DIETHYL MALONATE



KAY FRIES SPECIFICATIONS

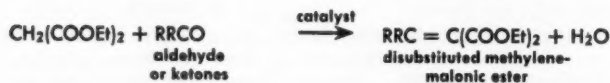
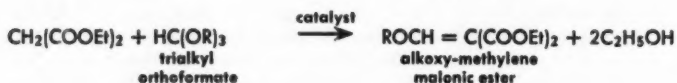
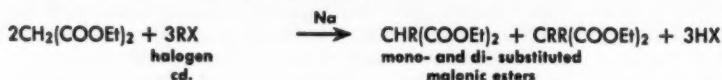
purity	99.0% min.
nitrogen	0.01 % max.
acidity	0.1 % max. as malonic acid

A new high purity DIETHYL MALONATE has been developed by the Kay Fries laboratories. Kay Fries DIETHYL MALONATE, an old stand-by of the organic chemist, is available in commercial quantities.

Through this improved quality, development of new uses will be aided, and the operation of established processes made more efficient.

An active methylene group in a dicarboxylic acid ester is of particular interest and has been responsible for much of its present use in the manufacture of pharmaceuticals, including barbiturates and anti-malarials.

TYPICAL REACTIONS



(Many substituted malonates may be hydrolyzed and decarboxylated to the corresponding subst. acetic esters.)

American-British Chemical Supplies, Inc.

Selling Agents For



KAY-FRIES CHEMICALS, INC.

180 Madison Avenue, New York 16, N. Y. •

Murray Hill 6-0661

DISTRIBUTION

But the \$1½-million facility is not meant just to provide storage. Its primary economic job is to split the ship loads into land-size packages. And here Lehigh, with its nine-warehouse experience, takes charge. The new terminal will be geared to make shipments in tank cars, tank trucks, and drums.

Testing, Too: Here again, the variety of Dow's cargoes has its impact. The tank-car loading area can accommodate 16 cars at a time, eight of which can be loaded simultaneously with all six major chemicals. Each loading station also has complete car-washing facilities for incoming empties.

The tank-truck outlet has five separate pipelines (caustic is the exception), and the drumming plant will, for the present, handle just carbon tetrachloride and perchlorethylene.

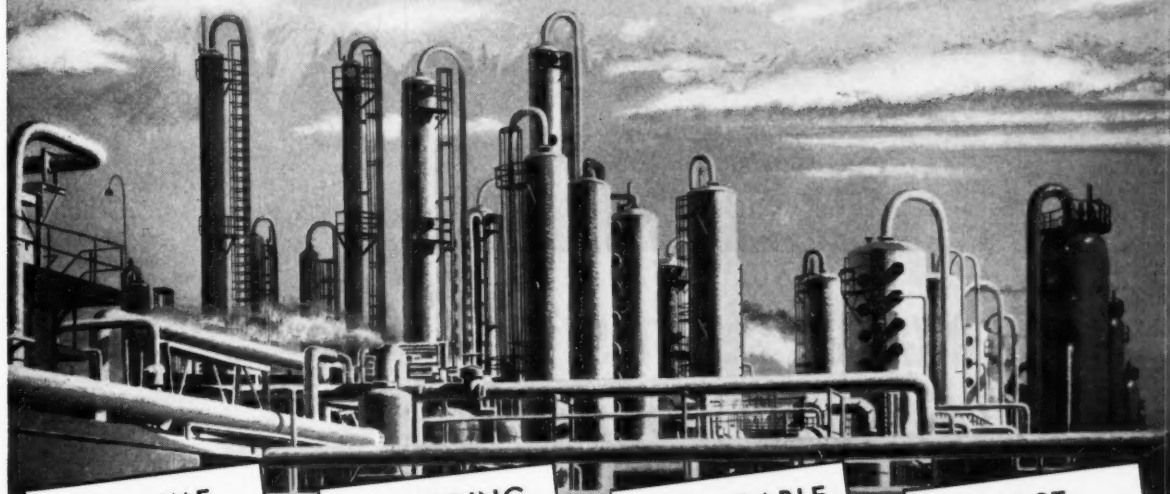


LEHIGH's MONAHAN: Keeping pace with sea-borne chemicals.

A laboratory at the terminal will test all incoming and outgoing shipments. To protect the quality of the products, each commodity has its own complete pipe network from shipside to loading rack.

It is the drumming operation that probably weighed most heavily in Dow's decision to make a striking departure from its present distribution pattern. The *Marine Chemist* has always carried a partial dry-cargo load of chemicals in drums. But it has never been able to unload these drums at the bulk terminals—such as GATX's at Carteret. As a result, the ship had to make a separate stop, usually at the Lehigh warehouse in Port Newark, to discharge this relatively small part of its total cargo.

Celanese* *synthetically produced* **NORMAL BUTANOL**



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DEPENDABLE
SUPPLY

COST
STABILITY

can eliminate the uncertainty in your planning

Celanese Normal Butanol is now in commercial production. Assurance of large-scale continuous supplies and greater price stability offer users a solid basis for their long-range planning.

If you are now employing normal butanol in your processing, the flexibility of Celanese production will give you greater freedom in scheduling increases in production. If you are now foregoing the advantages of this versatile alcohol and solvent because of uncertainties of

supply, we would like to show you how our production can keep up with your needs. Write for technical bulletin and sample.

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SELECTING THE PLANT SITE... *another Ferguson Service to Industry*

Ferguson's plant site location specialists understand the importance of selecting a plant site in the most desirable spot.

The following factors are important to you and each point is carefully considered in relation to manufacture and distribution:

Available raw materials . . . Dependable manpower
 . . . Soil conditions . . . Waste disposal . . . Reasonable
 tax structures . . . Availability of water . . . Proper
 drainage . . . Suitable climate . . . Power . . . Sensible
 real estate values . . . Room to expand . . . Clean,
 progressive communities . . . Nearness to domestic
 markets . . . Access to world markets . . . Transportation.

Complete planning is essential before the first move is made. Why not arrange a meeting with our plant site location specialists before you decide to buy? This work is all part of Ferguson's engineering and building service to industry.



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 5th St. • CINCINNATI OFFICE: 826 Enquirer Bldg. • SAN FRANCISCO OFFICE: 74 New Montgomery St.

DISTRIBUTION

Now it and the new tanker can bring up materials in bulk and have them drummed at the northern end of the voyage.

More Capacity: The relationship with Lehigh will not, however, drastically change Dow's present arrangements in the New Jersey-New York area. Glycols and 50% caustic will still be put into tank cars, tank trucks, and barges via the GATX terminal at Carteret. And the Patterson Oil Terminal at Paulsboro will continue to handle Dow carbon tetrachloride, ethylene dichloride, and chloroform.

GATX, Patterson, and Harbor Tank Storage (West New York, N.J.) all provide the basic chemical know-how and testing facilities necessary to qualify as chemical distribution points. Carbide and Carbon, for instance, maintains a laboratory of its own at the GATX terminal to supervise drumming and canning operations on the premises.

But the movement of sea-going chemicals has reached such proportions that additional, specialized capacity is needed. And the Lehigh Tank Terminal (as the new facility will be called) was set up to cash in on that need.

Information Please

Chemical market researchers now have one more convenient source for information. The Foster D. Snell organization (New York), publishers of the monthly Chemical Market Report, has made its file summary of abstract reports available to interested researchers.

- Commercial Solvents Corp. has issued Nos. 15 and 16 in its new series of Technical Data Sheets. These two cover amyl acetate and n-butyl acetate.

- "Economics of Railway Freight Car Construction" is the subject of a 52-page pamphlet being distributed by Marshall Railway Equipment Corp. (New York). A condensed version of the report—which grew out of a Wharton School industrial-management thesis—will be off the presses this week.

- Arthur Smith, chief agriculturist of Mathieson Agricultural Chemicals Co. division of Mathieson Chemical Corp., is the author of "The Good Earth—Our Richest Heritage." Published by the Texas Friends of Conservation (Houston, Tex.), the 56-page booklet covers fertilizers, soil structure and soil conservation methods.

New England Sales: The Textile Fibers Dept. of Carbide and Carbon

Chemical Week • April 25, 1953

• Davison Bulletin •

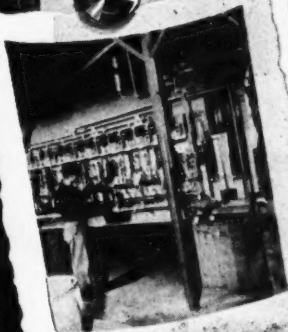
CONFIDENTIAL CONFIDE

Confidential handling of catalyst problems is one of the reasons why Davison is the major catalyst producer in the country. Intricate coding plus restricted internal distribution keeps your catalyst secrets safe in Davison hands.

Davison recognizes that catalysts are the heart of chemical reactions, therefore, they are a most carefully guarded secret.

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Bring your catalyst problem to Davison where you are assured of confidential handling. Call your Davison Field Service Engineer or write.



SOME STANDARD CATALYSTS AVAILABLE

$V_2O_5 \cdot K_2SO_4$ on Silica

$SiO_2 \cdot Al_2O_3$ Combination

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HYDROGEL to induce microporosity

Manufacturers are using economic hydrogel to induce microporosity in rubber, resins and plastics. Material is a highly hydrated amorphous silica. The hydrogel, which is incorporated in rubber products, shrinks during drying operations thereby inducing porosity.

Davison hydrogel (SiO_2) x H_2O is colorless, translucent and available in semi-solid lumps or finely divided. The range of pH is 5.7 — 6.8.

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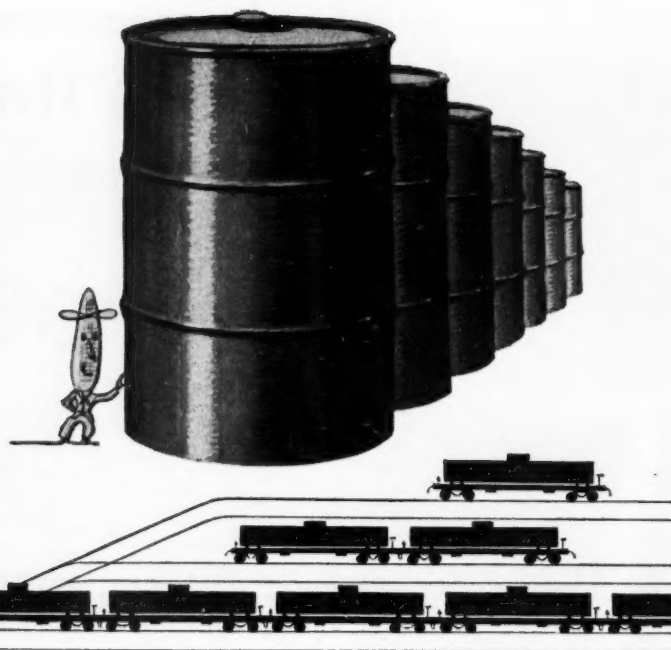
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Sorbitol is plentiful . . .

Sorbitol's supply is unaffected by the factors which often limit the availability of other polyols. It's made from a natural raw material—corn sugar or other refined sugars—of which some 20 billion pounds are available each year. Atlas manufacturing facilities can produce millions of pounds of sorbitol annually, and this capacity can be increased quickly and economically. Sorbitol is a major product of Atlas . . . not a by-product.

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Despite inflation, sorbitol costs less today than it did six years ago. Its price has dropped steadily . . . while other polyols have fluctuated widely. This has been accomplished through expansion and refinement of the Atlas process.

COMPARE ALL POLYOLS

before you buy . . . and choose the one that proves superior on *every count*. To help you utilize sorbitol's unique characteristics in your product, Atlas offers full technical information and research service.

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Write for this free booklet,
"The Sorbitol Story."



DISTRIBUTION.

Chemicals Co. opened a New England district sales office at Chelmsford, Mass., for the distribution of Dynel to mills in that area.

Kansas City Driers: Witco Chemical Co. (New York) has stocked a complete inventory of paint driers at the Crooks Terminal Warehouse facilities in Kansas City, Mo.

Together: The sales and executive offices of Innes, Speiden & Co. and its parent firm, Berkshire Chemicals, Inc., have been consolidated in the latter's Graybar Building (New York) headquarters.

Merger: The Wholesale Divisions of S. B. Penick & Co. and The New York Quinine & Chemical Works have merged their drug lines. One order, one shipment, one invoice can now cover items from both companies.

Foreign Trade Unit: Brown Chemicals Co.'s new export-import division will be known as Brown-Millbank Corp. (New York).

Full Scale: Dar-Syn Laboratories subsidiary of Metalsalts Corp. has moved from pilot-plant to full-scale production of procaine hydrochloride.

First Delivery

The "Carl Schmedeman," Reynolds Metals' self-unloading bauxite freighter, (CW, Nov. 29) has made additional news by being the first ocean-going vessel to pass through a seven-mile channel recently dredged across Corpus Christi Bay. It was making the first aluminum-ore delivery to the company's La Quinta alumina plant, due to start operation in June.

The ore was brought to Texas from Reynolds' mines in Jamaica. Heretofore, the "Schmedeman"* has been delivering Jamaican ore to Mobile, Ala., for transshipment to the aluminum-maker's alumina plant in Arkansas. But now, with the near completion of the La Quinta works, a stockpile is being built up at the Corpus Christi location.

When the new alumina units go into operation, they will form—with the adjacent reduction plant completed last year—the only completely integrated bauxite-to-pig-aluminum process line in the industry.

Ocean Service: With a rated daily capacity of 1,000 tons of alumina, the newest addition will require the services of two ore vessels: the "Schmede-

* Named after the late chief geologist of Reynolds Metals.

FOR REAL VERSATILITY



KOPPERS RESORCINOL

• Koppers Resorcinol is a water soluble, crystalline, dihydric phenol. Possessed of very high reactivity, it undergoes most of the typical reactions of phenols including nitration, alkylation, condensation, etherification, and oxidation.

Resorcinol is used extensively in the preparation of room-temperature-setting resorcinol formaldehyde resin adhesives for the bonding of reinforcing fibers to synthetic and natural

rubber. Industrial belting, hose, and tires are among the many products made stronger by resorcinol-based resin adhesives. These adhesives have found wide application also in wood bonding where waterproofing and permanence are mandatory. In addition, Koppers Resorcinol is used in the production of dyestuffs, pharmaceuticals, textile and leather chemicals, explosives, and plasticizers.

To show you the wide variety of important uses to which Resorcinol is admirably fitted, Koppers has prepared an interesting illustrated booklet. To obtain your copy, just fill out and return the coupon.



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Diethanolamine

Warehouse stocks of Diethanolamine are available in principal industrial areas. Larger quantities are shipped directly from our plants.



Phone or write our nearest office for complete information.

CARBIDE AND CARBON CHEMICALS COMPANY

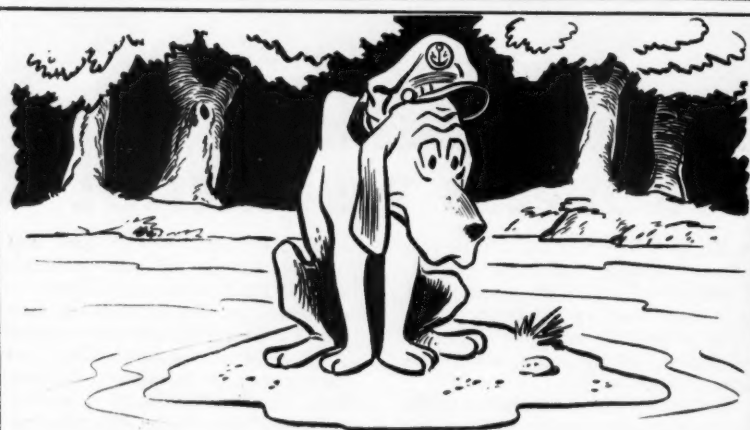
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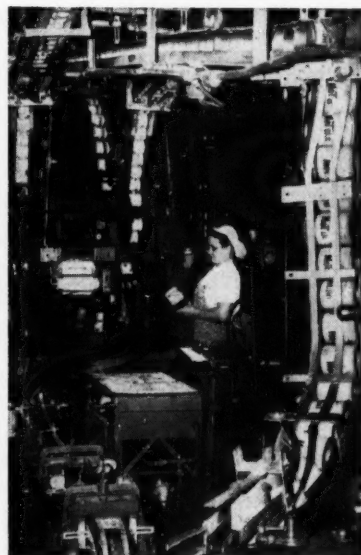
man" and the "Dragon." The first will bring in 12,500 tons of ore every 8-9 days, while the latter will make 7,800-ton deliveries at 10-11-day intervals. This rate will mean that the La Quinta plant is expected to take 700,000 tons of the planned 750,000 ton annual output of the Jamaica operation.

Canned Without Tin

The country's tin bill since 1941 has been reduced by a total of \$495 million, says Berton S. Clark, scientific director of American Can Co., as a result of industry and government tinplate conservation programs.

"In 1941," he explains, "46,900 tons of tin were used in the production of tin mill products in the U.S. for containers, but by 1952 this figure had come down to 27,772 tons, even though about eight billion more cans were produced by the entire industry."

And this month his company, American Can, reveals that it has made a major advance toward the common



TINLESS CAN: Volume production for Canco's pride.

goal of all tin-saving efforts: a can that uses no tin whatsoever.

Canco's new development, now at the large-volume stage, is a black-plate container with a cemented side seam designed specifically for motor oil distribution. The thermoplastic compound along the seam replaces the usual tin-lead soldered joint, and it allows for complete around-the-can lithography as a protection against corrosion.

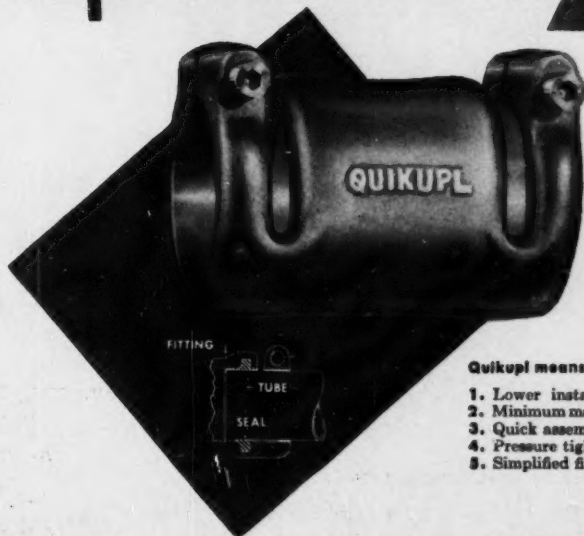
Basis for the volume production: a potential market amounting to 500 million gallons of motor oil a year.

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With one eye on cutting costs and the other on reducing installation and maintenance time, our Mr. Pinchpenny is typical of the many thrifty executives constantly on the lookout for new and better products . . . You can tell from the smile on his face that he has found a real money saver in QUIKUPL®, the patented stainless steel fitting which makes it possible to join pipe or tube without threading or welding. To get the complete story write for Bulletin Q100 today.

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LEADING PRODUCERS OF **STAINLESS STEEL** VALVES, FITTINGS AND CASTINGS



Wyandotte Caustic Soda is now available in convenient open head drums!

**Look
at these
advantages:**

Visible Supply!

No more guesswork. You can instantly see how much caustic remains in the drum.

Easily Accessible!

No more tilting, or turning the drum upside down to get at the remaining caustic.

Safety!

The rolled edges and open head protect the user from cuts and caustic burns.



The high quality of Wyandotte caustic in the new open head drums is unchanged. You'll still find among Wyandotte's many grades and forms the caustic soda best suited to your needs — for soaps, detergents and metal cleaners; food processing; paints, inks and dyes; for insecticides and textiles.

You'll find Wyandotte a reliable and helpful source for all alkalies — caustic, soda ash, bicarbonate of soda, chlorine, calcium chloride. Write Wyandotte for our new caustic soda booklet . . . for help in specifying the right grade for your processes, consult Wyandotte.

For Pilot-Plant Operations

Wyandotte Mercury Cell Caustic (50% liquid) can be obtained in nickel drums for pilot-plant operations, as well as in commercial quantities. This reagent-grade caustic is ideal for pilot-plant use, since the grade need not be changed when you convert to commercial production. This eliminates the "bugs" that often arise when a different grade is used in production than in the pilot-plant process.

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN
OFFICES IN PRINCIPAL CITIES

 **Wyandotte**
CHEMICALS

SPECIALTIES

NEW DEVELOPMENTS in agricultural chemicals in the past few years have put a number of major chemical firms in an unusual position—that of selling a farm specialty directly to the public for the first time.

Right now, garden supply centers are receiving shipments of a new 4-oz. package of Crag Herbicide-1, the weed preventer developed by Carbide and Carbon Chemicals Co. (division of Union Carbide and Carbon Corp.) at Boyce-Thompson Inst. for Plant Research. It's the first time Carbide has tried direct-to-the-gardener selling* and the new 4-oz. packet is the first time CH-1 has been offered to the public nationwide in small (less than two pounds) units.**

Setting up the machinery to put Crag Herbicide-1 into national distribution—developing the container, the label, and its wording, the shipping and display cases, lining up distribu-



1 TOP-LEVEL DECISION, to sell Crag Herbicide-1 in a garden-size package was made last spring. Thousands of letters from gardeners influenced the move.

After a Winter of Worries . . .

tors—has taken almost a year of intensive work.

This week, CW CAMERA follows

* There are, however, some other U.C.C. consumer products—6-12 insect repellent; Ever-ready batteries; Prestone, etc.

** The Grange League Federation sold glass containers with four ounces of Crag Herbicide-1 last year. It had only limited distribution.

Carbide's Crag-1 team through 12 months of work and worry, as they fit together this campaign to sell their herbicide to the home gardener.

Headache Powder: Crag Herbicide-1 is the sodium salt of 2,4-dichlorophenoxyethyl sulfate. In this form, it is not a weedkiller, but when activated

by soil microorganisms (apparently becoming 2,4-dichlorophenoxyethanol) it kills weed seedlings as they emerge in the upper soil layer, although it doesn't harm established plantings.

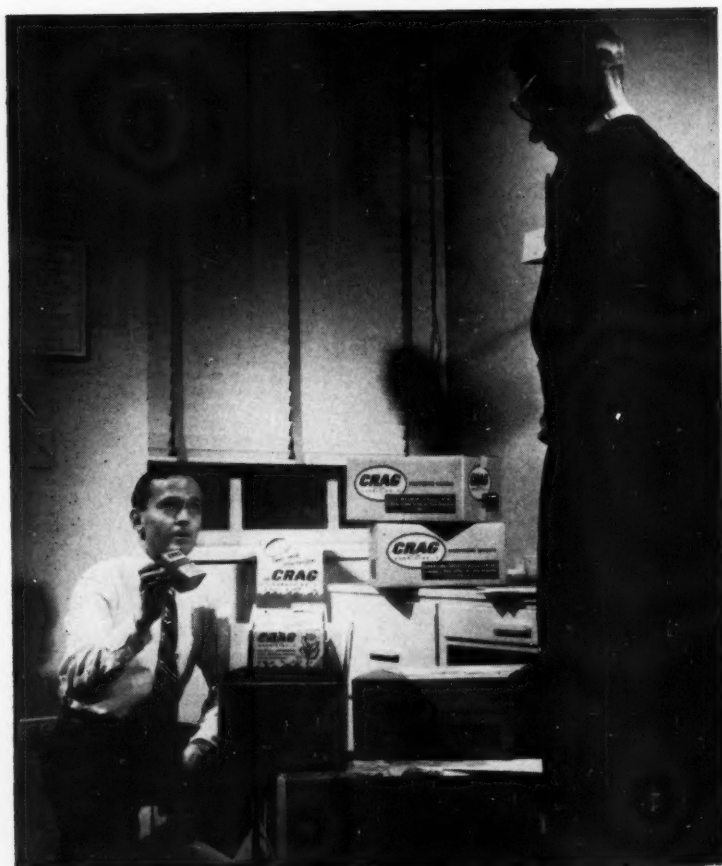
This weedkiller has been sold with considerable success to commercial growers for several years, so that Car-



2 ART DEPT. roughed out container designs, planned display, shipping cartons.



3 LABEL WORDING was thrashed out—product manager, advertising men, plant experts sat in with legal counsel—and results checked with USDA.



4 HERBICIDE CANS, display boxes, shipping cartons and product literature decided upon, turned out in quantity. Part of ad staff looks them over.

LYN CRAWFORD

... Gardeners Get a Weedkiller

bide was by no means starting with an untried product. It had a well-established distribution system for sale of its ag products to commercial growers, which helped materially in developing a setup for selling the 4-oz. cans of CH-1. But other difficulties, intensified by the haste with which work had to be done, created plenty of headaches for the Carbide staff.

Command Performance: It was the success of CH-1 in commercial farming that prompted much of the consumer demand for handy-size units. After many articles pointing out the advantages of using the weedkiller had appeared in horticultural journals, Carbide got over 10 thousands of requests — many with money — for samples.

This demand was checked by a careful consumer and market survey. Then the decision to go ahead with a small package for home use was made.

Smallest CH-1 unit Carbide had sold was a two-pound, coffee-bag style package. But one formulator had pro-

moted with some success a 4-oz. glass bottle of CH-1; Carbide officials felt similar-sized units might sell the nation over.

They decided a fiber can would be better, however, and settled on a cocoa-can type package, which was sturdier, packed more easily, and was cheaper to make and ship than a glass one.

With the unit set, an attractive label was worked out. To go with it, a colorful display box holding 12 4-oz. cans was designed. And then "shippers" holding three display cases, and "master shippers," holding four shippers, were planned.

Label Tangle: While basic container design was in the works, the product manager, Boyce-Thompson plant experts, advertising representatives, legal advisors—even doctors—huddled on producing a correct yet attractive label.

CH-1 had originally been USDA-registered for use in strawberry growing. Last year it was o. k'd for several more crops. And Carbide's staff knew

SPECIALTIES.



5 FILLING, packing and shipping is being done by contract packager in Philadelphia.



SID CARSON

6 GARDEN STORES were getting CH-1 by last week; distribution is national.



7 IN THE GARDEN: It's registered for 56 plants now, is being tested with still more.

The only West Coast



manufacturer of
a full line of
**Sodium
Phosphates**



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SPECIALTIES.

that it would be registered for some 56 plants this year.

Eventually, the label, with required precautionary warnings and basic directions, was worked out. More complete instructions were included on a small folder inserted in every can. The label and packed-directions were then thoroughly checked with the U. S. Dept. of Agriculture.

Consumer Campaign: Consumer promotion was not neglected, either. As the package and label were evolved, the promotion campaign was set up. It included advertising in garden journals (slated for this month), consumer sales folders, ad kits for the merchandisers, window streamers, and the like.

Carbide decided on a contract packager to fill and ship CH-1, chose Seaboard Laboratories (Philadelphia, Pa.) to get things under way. Seaboard, already packing Carbide's 6-12 insect repellent, put in the necessary equipment to fill CH-1 and launched its loading program.

Seed and garden supply centers, already familiar with Crag agricultural chemicals, were lined up to retail this latest no-hoe aid. The middle states are swinging into the gardening season now, and shipments of the herbicide are rolling in none too soon.

It hasn't all gone as slick as wet marble. As in the case of any new undertaking where time is a factor, there has been long overtime work for everyone involved, and maddening delays.

Labeling has more and more become a complicated project. With a new product slated for national sales, state labeling regulations add to the problems. And packages, in addition to fulfilling labeling laws, must meet mailing and interstate commerce regulations. Carbide has met and surmounted these difficulties; most recently, packaging slowdowns has been a worry, but this, too, has been whipped.

Profits in Soil: But Carbide has good fortune in going on the market with a product that has been widely tried—not only in state experimental stations, but in extensive commercial farms. Unquestionably, though, it will be in for some surprises when the public at large gets its hands on Crag Herbicide-1.

The major uncertainty that lies ahead now is, of course, how CH-1 will sell. It's a calculated risk, that could be quite profitable. And like Monsanto, which set up a merchandising unit to sell its Krilium, Carbide seems to think it can depend on the soil.



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Churn, 100 gal BP, vacuum, w/jacket. Heat & Power Co., Inc., 70 Pine St., N.Y. 5.

Colloid Mill, 15" Premier-Unused. Four years old but still in original crate. (Phila., Pa.) FS-7634, Chemical Week.

Condensers, seven—never used; 180 sq. ft. capacity each. York, Steel Tubes, Steel Shell. (Phila., Pa.) FS-7634, Chemical Week.

Day Double Arm 55 Vac. Mixer, 5 gal. working Equipment Clearing House, Inc., 285 10th St., Bklyn. N.Y.

Dryer, Louisville Steam Tube, 6' x 35' comp. Heat & Power Co., Inc., 70 Pine St., N.Y. 5.

Dryer, Vac. Shelf 20 Shelves, 59 x 78, pump cond. (5) Consolidated Prod., 18 Park Row, N.Y. 38.

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Hydrator, Rotary, 5'x22' Buffalo (2). Heat & Power Co., Inc., 70 Pine St., N.Y. 5.

Mikro-Pulverizers—#1-SH, #1-SI, #2-TH, #2-SI. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

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SPECIALTIES

Matter of Form

Liquid soil conditioners can produce "dramatic" effects in surface application to prevent crusting, but for most applications, the powder form works best. That's the way Monsanto's Howard K. Nason put it at a recent American Chemical Society meeting in New York, where he reviewed the role of synthetic soil conditioners.

Only recently, Monsanto offered a liquid Krilium to gardeners; the new material, which Nason described as chemically related to the powdered vinyl acetate-maleic acid compound type, is suggested for crop row treatment.

In addition to its Krilium for gardeners, Monsanto has just introduced Bondite, a soil stabilizer—both polyacrylate types and vinyl acetate maleic acid types are offered—for use along highways, construction sites, etc. Although it can be applied dry or in water solution, Monsanto is pushing high-pressure spray application by means of an apparatus developed by the Connecticut Highway Dept.

And now that patent questions about soil conditioners seem to have resolved themselves—Nason mentioned that over 50 firms have licensed with Monsanto now—several firms have opened up somewhat on their soil conditioner programs. B. F. Goodrich, one such, is now promoting its K-700 (sodium polyacrylate).

A vinyl acetate-maleic acid conditioner has just been introduced by Eston Chemical (Div. of American Potash & Chemical Corp.). Eston tabs its Monsanto-licensed product Tronatil, will sell it nationally.

Not all the news about soil conditioners has been good, however. Henry A. Dreer, Inc. (Philadelphia), a seed company that was in the van with the marketing of its Fluffium conditioner, was declared bankrupt last week. The firm made a spectacular name last year in promotion of its product, but in the face of numerous setbacks—including a Federal Trade Commission complaint about its advertising—its new management's luck ran out. It was listed as having \$679,000 in liabilities.

Super Chlorination

Pouring in 10-20 times the usual amounts of chlorine, public health authorities in New Haven, Conn., working with Yale University, have perfected a method of pool chlorination said to eliminate practically all bacteria in the water even when crowded with swimmers.

And despite the increased use of chlorine, these researchers report, complaints of eye irritation are only one-fifth of those normally reported.

Key to the new success, largely the work of Eric W. Mood, is maintaining the pool water on the alkaline side by means of soda ash. This permits a significantly higher concentration of residual chlorine, although the irritation effects are lowered.

Keep it Clean: Prime plus of the new system, which has been tested for two years at Smith College, Yale, and Hartford, Conn., pools, is its ability to maintain a low bacteria concentration. Mood reported that where ordinary chlorination gives a permissible bacteria count of 200 microorganisms per milliliter of water, the new system reduced the count to zero. And in the outdoor pool in Hartford, where the concentration has gone to 2,000 organisms per milliliter, his process brought the count down to one per milliliter.

By using more chlorine, soda ash and aluminum sulfate, the cost of maintaining a pool is unavoidably raised. Cost in an outdoor pool is increased about 12 times (to about \$12/day) but cost with an indoor pool is only doubled. There's one saving feature—in addition to the improved sanitation—the water filter cleaning is greatly reduced.

Better Building

Promising improved concrete and cement, several new chemical additives are being readied for the market.

• Shield Chemical Corp. (Verona, N. J.) is getting into full scale production of Drycrete, its cement additive for integral waterproofing. Drycrete is an oily, nonwater-soluble liquid, (composition not revealed, but Shield does state that it is not a silicone-based product), which is mixed with plaster or cement at the rate of one gallon per bag of cement. Incorporated in a coating cement, it is claimed to make below-grade masonry completely waterproof, and to offer a surface that can be painted in the ordinary manner.

The additive costs about \$2.70/gal. in quantity; it is to be sold through building and supply dealers rather than directly to home owner. Although it hikes the per-coat cost of plastering, Shield calculates that because one coat of Drycrete-containing plaster equals about two of untreated plaster, there is an over-all saving.

Shield produces several waterproof-

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SPECIALTIES.

ing compounds, including a silicone type, and is readying a waterproofing mastic, to be introduced soon.

• Mearl Manufacturing Corp. (New York) is coming out with another sort of additive, an air-entraining agent. Tagged Mearlcrete P, it is a reaction product of hydrolized proteins with other chemical additives, is suggested for use in manufacture of low-density concrete and mortar.

A liquid, Mearlcrete is said to permit manufacture of concrete of densities as low as 12 lbs./cu. ft., and in concrete foams of this sort, to make a nonshrinking material without altering its setting time.

• Not a concrete additive, but a product designed to waterproof concrete and cinder blocks is a masonry coating, Styrox, made by Protex-A-Cote, Inc. (Newark, N. J.). Based on polystyrene resins, it's said to offer a coating resistant to soaps, alkalis, and chemical fumes. But the top advantage, the maker says, is the ease with which it can be coated on concrete to make it completely waterproof. It is claimed to be suitable for both above- and below-grade masonry. Styrox is available in a number of colors, and retails for \$6.75/gal.

• Vinyl Grip: Schwartz Chemical Co., Inc. (New York) is now selling a new vinyl cement, VC-2, particularly designed for the toy industry. The glue is suitable for patching many vinyl toys; some makers of toy products include the adhesive in the kits sold with their products.

• Grain Dip: H. L. Woudhuysen & Associates (New York) is setting up facilities to manufacture its new disinfectants and fungicides. Woudhuysen makes use of a process for formulation oil-soluble organo-metallics, and is currently offering three products: Mercusol, a solution of copper resinate and phenyl mercury salicylate; Merculine, a mercury solution; and Mercadmine, a combined cadmium-mercury solution. Typical usage calls for about 1 qt. of the fungicide/100 gals. water.

• Vet Help: Merck & Co. (Rahway, N. J.) is now making streptomycin available to veterinarians for treatment of swine enteritis, calf scours and similar infections. The new product, Vetstrep, is a granular form that dissolves quickly in milk or water given to animals. Product will be distributed through regular veterinary sources of supply.



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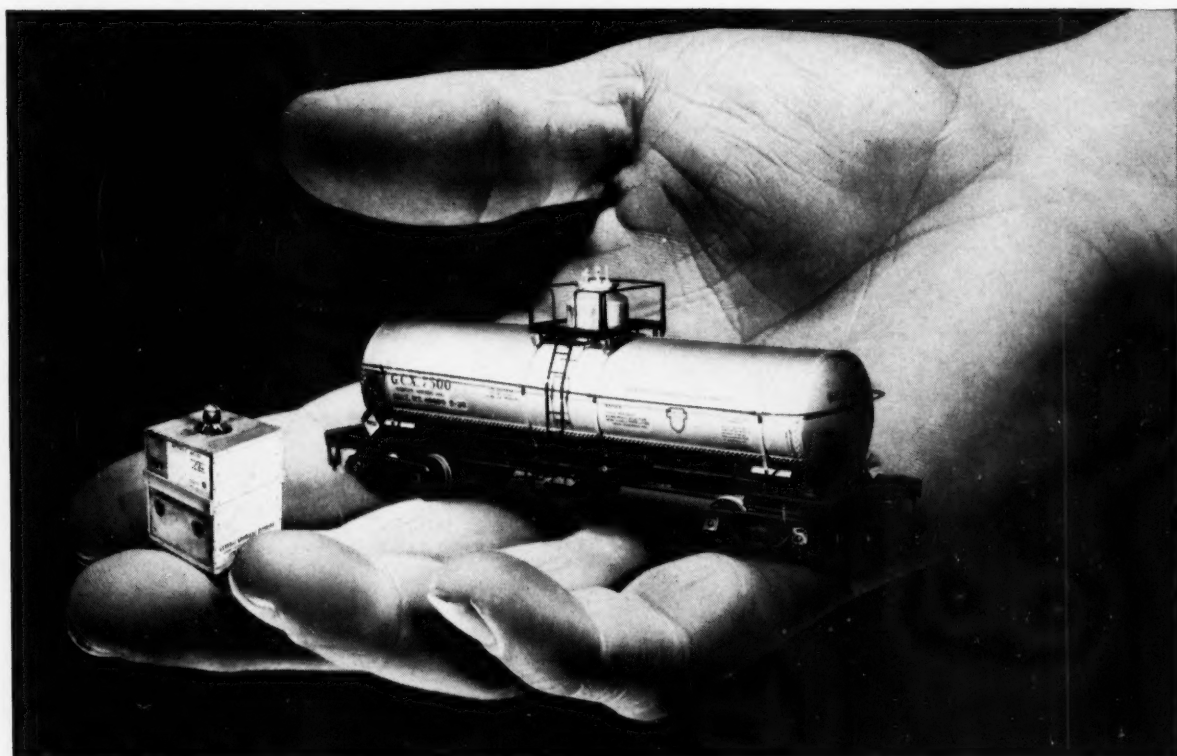
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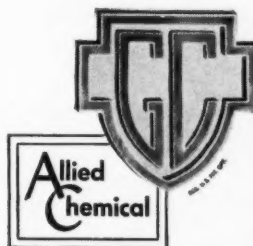
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